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BEGINNING READERS' LISTENING AND ORAL READING COMPREHENSION OF DELETION IN SENTENCES

by

© PATRICIA DIANE HOLT

A THESIS

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled "Beginning Readers' Listening and Oral Reading Comprehension of Deletion in Sentences" submitted by Patricia Diane Holt in partial fulfilment of the requirements for the degree of Master of Education.

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ABSTRACT

The purpose of the study was to investigate the relationship between grade two students' listening and oral reading comprehension of sentences in which optional deletion transformations have and have not been applied.

Subjects were asked to listen to a passage and also to read orally a passage in which deleted and nondeleted sentences were alternated and balanced. After each full passage, subjects heard or read the test sentences from the passages again and were then asked a comprehension question to which they responded orally. The passages were based on stories taken from the Ginn Basic Readers and the comprehension test was constructed for purposes of the study.

There were forty-eight subjects in the sample. They were all in their second year of school, were not learning English as a second language, and were not suffering from noticeable hearing or vision difficulties. They also all passed a word recognition test consisting of all of the words used in the passages.

It was found, on the overall analysis, that there was no significant difference between listening and oral reading comprehension. However, when level of difficulty of the items and the deleted and nondeleted form of the items were considered, some significant trends were noted. Ease or difficulty was defined in terms of performance on the test. For easy transformations in nondeleted form, reading comprehension scores were significantly higher than listening scores. For difficult transformations in the nondeleted form, listening compre-

hension scores were significantly higher. For easy transformations in deleted form, there was a significant trend for listening scores to be higher.

In analyzing the results of the scores on deleted and nondeleted items, a trend was noted favoring the nondeleted or intact form of the item.

Scores on the research instrument were compared with sub-scores of the Stanford Achievement Test, but no significant correlation between them was found. General academic achievement does not appear to be a good predictor of performance on the test of specific syntactic understandings or vice versa.

It was concluded that grade two children do not find either listening or reading consistently more effective than the other in attaining comprehension. The ease or difficulty of the sentence does not appear to be directly dependent upon transformational history of the sentence, but there does appear to be a complex interrelationship between these three factors.

The interplay between the language used, the level of difficulty of the material and the mode of presentation of the material which appears in the analysis of the data of this study gives an indication of the complexity of the question of comprehension.

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CHAPTER I

INTRODUCTION

STATEMENT OF THE PROBLEM

When reading comprehension is seen as reconstruction of a message and understanding of the message so reconstructed, then listening comprehension should be very closely related to reading comprehension. Together they make up the receptive side of language. Reading comprehension, at least in the beginning stages of reading, seems to involve changing the graphic symbols into the same kind of oral-aural message as would be the input for listening comprehension. This implies a close relationship between the oral reading and the listening processes.

Children depend on their knowledge of the language and its syntactic patterns to aid comprehension (Goodman, 1970; Loban, 1963; Strickland, 1962). If a discrepancy between listening and oral reading comprehension is likely to occur, it might result when the syntactic patterns become more difficult.

The study was an extension of Cosens' (1974) research which investigated the effect of deletion on the word identification and comprehension of grade one and two children. In her study, the effect on word identification was measured by analyzing oral reading errors, the effect on comprehension was measured by a cloze test (answered orally at the grade one level). Concerning comprehension, her findings were that the presence of redundant information as in nondeleted forms of sentences was an aid to comprehension. It was recommended in her study that further investigation of deletion produced structures be carried out in oral language comprehension and production.

The purpose of this study was to investigate the nature of the relationship between a beginning reader's listening comprehension and oral reading comprehension of the same sentence types involving deletable material. Listening comprehension referred to listening to and understanding written material being read aloud, rather than listening to spontaneous speech or conversation.

DEFINITION OF TERMS

Certain terms used in this study are defined as follows:

Transformations

In theoretical linguistics, transformations are formal operations which show relationships between sentence types.

Deletion Transformation

The deletion transformation defines one type of relationship between sentences. It serves to delete redundant material from the sentence string, subject to certain conditions, and it allows for systematic paraphrasing of an idea. An example of a nondeleted form would be, "Buttons, who is the clown's dog, can do tricks". The sentence which would result after the deletion transformation had been properly applied would be, "Buttons, the clown's dog, can do tricks".

Deleted Items

Deleted items are test sentences in which the deletion transformation has been applied.

Nondeleted Items

Nondeleted items are test sentences in which the deletion transformation has not been applied.

Easy Items

Easy items are the three items in each task (listening or reading) on which the subjects made the highest scores.

Difficult Items

Difficult items are the three items in each task on which the subjects made the lowest scores.

Reading Task

A reading task is a child's oral reading of the written text.

Listening Task

A listening task means a child listening to an oral reading of a written text.

High Achievers

High achievers are those children scoring stanine 7, 8, or 9 on the Paragraph Meaning Test and the Word Meaning Test of the Stanford Achievement Test.

Average Achievers

Average achievers are those children scoring stanine 4, 5, or

6 on the Paragraph Meaning Test and the Word Meaning Test of the Stanford Achievement Test.

HYPOTHESES

This study was designed to investigate the question: What is the difference between a grade two child's listening comprehension and oral reading comprehension of sentences resulting from application of the deletion transformation? In other words, what is the relationship between modality and the form of the sentence? The following research and null hypotheses were proposed:

Hypothesis One

Since grade two children are still quite inexperienced readers but have considerable experience in understanding what they hear, it was felt that listening comprehension would be more effective for them than reading comprehension, and that overall listening scores would be higher.

Research Hypothesis One. Listening comprehension scores will be significantly higher than reading comprehension scores.

Null Hypothesis One. There will be no significant difference between listening comprehension scores and reading comprehension scores.

Hypothesis Two

Cosens (1974) found a tendency for deletion produced structures to be more difficult than intact sentences and, especially on difficult items, reading comprehension was aided when sentences were in intact form. In expanding the question to include listening comprehension, it was felt that because of the children's experience with listening, there would be little or no difference in their understanding of the two forms. However, it was expected that reading comprehension would be aided by the presence of the redundant content information provided in the nondeleted form of the sentence.

Research Hypothesis Two.

(a) There will be no significant difference on listening comprehension scores between deleted and nondeleted items.

(b) Reading comprehension scores on nondeleted items will be significantly higher than on deleted items.

Null Hypothesis Two.

(a) There will be no significant difference on listening comprehension scores between deleted and nondeleted items.

(b) There will be no significant difference on reading comprehension scores between deleted and nondeleted items.

Hypothesis Three

Since both listening to and reading of stories are an important part of the grade two child's school activities, and since answering comprehension questions about stories also is stressed in reading lessons, it was felt that children's ability to respond correctly to the Listening-Reading Comprehension Test would reflect their general level of reading achievement.

Research Hypothesis Three. Listening and reading scores on the test instrument will correlate significantly with general reading achievement scores as measured by the *Stanford Achievement Test*.

Null Hypothesis Three. There will be no significant correlation between listening and reading scores as measured by the Listening-

Reading Test and general reading achievement as measured by the subtest scores on word meaning and paragraph meaning of the Stanford Achievement Test.

The null hypotheses will be considered to be rejected at the .05 level of significance.

LIMITATIONS

This study was limited to the investigation of only six types of one general transformational process — deletion. While these six deletion transformations occur quite frequently in children's books and readers, they by no means exhaust the possibilities of sentence structures which could have been selected for investigation. However, they were chosen because they are easier to identify than many other structures, and because Cosens (1974) had already begun the work in this area.

Only one grade was included in this study and it was intended that the subjects be beginning readers. However, by the end of grade two many children seem to have progressed past the point of the beginning reading process and could be considered to be quite proficient.

The subjects, who were randomly chosen for the study, all fell into the categories of average- or high-achievers. Thus through circumstance, no low-achievers were included. The subjects were all from fairly large urban, middle-class elementary schools.

Listening was defined as listening to someone reading written material aloud and therefore listening to spontaneous speech or conversation was excluded from the study. Reading comprehension meant the understanding of material read aloud and therefore silent reading comprehension was excluded from this study.

SIGNIFICANCE OF THE STUDY

If one optional form of a sentence pattern is more difficult for a child to understand than the other, then it would be helpful for those people preparing reading materials to be aware of this, so as to avoid unwitting use of the difficult option.

If listening comprehension seems generally better for beginning readers than their oral reading comprehension, this may be worthwhile capitalizing on for reading instruction. This means that if a child has difficulty in reading, it may be helpful or even necessary to build up his comprehension in a listening situation before asking him to apply it to reading. This would seem to be especially so when the main stumbling block to comprehension may be his unfamiliarity with syntactic patterns. Exposure to those patterns in a listening situation may aid his comprehension of them in the reading situation.

CHAPTER II

REVIEW OF THE LITERATURE

> Essentially the only objective in reading is comprehension. All else is either a skill to be used in achieving comprehension (for example, selecting key graphic cues), a subcategory of comprehension for example, critical reading) or a use to be made of comprehension (eg., appreciation of literature). (Goodman, 1970, pp. 28-29).

For over a century educators have been interested in and concerned about reading comprehension and many definitions of comprehension have been put forth. Most people today still agree that reading is not word-calling; that without understanding of the meaning intended by the author, there is no reading. But a major question of current concern is whether reading comprehension is, after all, just comprehension, or whether reading comprehension is a special form of understanding, a unique skill in itself.

In 1964, Wagner wondered "to what extent the comprehension skills involved in reading are the same as, or different from, the comprehension skills children are called upon to use in listening and speaking situations [p. 114]." More recently, Carroll (1971a) carried this idea further and presented a paper defining language comprehension, as it applies in any language situation, including reading. As he stated:

> Comprehension of a message is adequate or satisfactory to the extent that the language receiver apprehends, at least provisionally, whatever linguistic information is present in the message and is able to relate that information to whatever context is available at a given time. This implies that comprehension may be regarded as a process that contains at least two stages:

> (a) apprehension of linguistic information, and (b) relating that information to a wider context [p. 24].

He feels that without this awareness of the context, "the total situation in which the message occurs [p. 22]", comprehension or understanding of the full meaning does not occur.

Placing reading comprehension in this broader context of language comprehension has resulted in such things as the movement toward language experience methods of instruction and the writing of linguistic-centered materials. Listening and reading have now been closely linked in instruction and the tendency in many new materials is away from a strict decoding emphasis such as the phonics approach supported by Chall (1967) and toward whole word, phrase, or even sentence approaches. The following quotes represent some of the notions currently in vogue:

> Perception alone is not enough: in both listening and reading, entire meaning-bearing language patterns must be not simply decoded but interpreted and evaluated. Interpretation and evaluation must take into account as part of the 'information' in the message, its emotional, volitional, denotative, and connotative content (Lefevre, 1968, p. 293).
>
> Word meaning can never be separated from phrase-meaning, sentence-meaning, paragraph-meaning or even book-meaning. . . . The goal should remain precise, lucid exchange and evaluation of ideas through speech and writing (Quaintance, 1971, p. 7).
>
> In either oral or written form, it is not the symbols, phonemes, or letters but the systematic structuring of these symbols that makes comprehension of meaning possible (Goodman, 1970, pp. 9-10).

Thus, two major threads are very evident in current thinking. One is that reading is a language-related process and, as such, is part of a broader context than was formerly acknowledged (Carroll, 1971a; Goodman, 1968, 1970; Lefevre, 1964, 1968; Quaintance, 1971; Ryan & Semmel, 1969; Wagner, 1964). The second is that comprehension is at least a two-stage process involving identification, decoding, or information-gathering of some sort, and the bringing or gaining of meaning by relating knowledge of language structure, experience, and the wider context of author intent (Carroll, 1971a; Chall, 1967; Fagan, 1969; Goodman, 1968, 1970; Harwood, 1966; Jenkinson, 1957, 1960; Ryan & Semmel, 1969; Smith, 1973; Stauffer, 1969).

Most of these people would likely disagree as to just where the break between the stages would occur and just what happens at each stage, but all would agree to the existance of at least two basic aspects to the comprehension process. They would also most certainly disagree as to the relative importance of each aspect. Chall (1967) believes that the decoding aspect is the critical one, particularly for beginning readers. People like Stauffer (1969) and Jenkinson (1957) see the thinking, relating, evaluating aspect as the more important one. Frank Smith (1973) sees the two stages of reading comprehension as the difference between the visual and non-visual information drawn on by the reader in order to comprehend. His argument with the others in this group would be on the sequencing of the steps. He feels that either one could occur first, or they could occur simultaneously.

Harwood (1966) gives a definition of listening comprehension which can be easily converted to include reading comprehension.

> When the signal is heard (seen), when it is converted to a message, and when that message is related to past experience by the person receiving, the signal and message are said to have been comprehended through listening (reading) [p. 23].

His definition illustrates the two aspects of this language process very well.

RESEARCH STUDIES IN COMPREHENSION

The questions of comprehension in general, listening and reading comprehension, and more recently, oral reading comprehension as opposed to silent reading comprehension, have been the subject of many research studies, few of which can be compared directly since they vary so greatly in focus, emphasis, design, analysis and the level of reading proficiency studied.

Investigations of Silent Reading Comprehension

Many studies have been conducted investigating the reading comprehension abilities of high school or adult readers. An interesting one was an exploratory study of the products and processes of the reading comprehension of high school students by Jenkinson (1957). Her basic view was that the meaning of a word or passage is a function of thinking or thought processes, and she investigated this aspect of comprehension through the cloze technique, having the students "think out loud" as they worked through the exercises. Her main concern was for analyzing the method by which each student obtained meaning and concluded that there is a need for greater flexibility of approach in gaining meaning.

Studies at the elementary level are not as common and many of them deal with the relationship between some aspect of language and some aspect of silent reading comprehension. Treadway (1970) looked at the language in the basal readers which children are asked to read, as compared with their own oral language patterns. It was similar in concept to Strickland's research (1962). Treadway went further and wrote selections for children to read, based on their oral patterns, and then he compared their performance on both types of passages. He used children in grade two and grade five, and he found that both levels preferred the selections based on their own language patterns. The grade two students were able to comprehend both equally well, but grade five students did significantly better on the passages based on their own language. Treadway found that the discrepancy between the two forms of language patterns was not as great at the grade two level as it was at the grade five, and concluded that when children are asked to read material that is different from their own patterns, reading comprehension is lower.

This was also the finding of Ruddell (1963) who examined the difference familiar and unfamiliar oral language patterns made in the comprehension of reading materials as the grade four level. A similar conclusion was also reached by Tatham (1968a). She extended Ruddell's study to compare grade two and grade four children. She also studied sentence comprehension rather than paragraph as Ruddell did, since it was thought that this would be more suitable for the younger readers. Each child had to read a sentence and then choose one picture (out of a choice of three) that matched the meaning. Although this test did not seem as reliable for grade four as for grade two, the results seemed to indicate that reading comprehension was better on materials written with language patterns familiar to the children and used by them.

Tatham also did a study of just grade four students' reading comprehension of familiar and unfamiliar patterns and again, "the results indicate(d) a relationship between the frequency of children's oral language patterns and reading comprehension of these patterns (Tatham, 1968b, p. 8)".

The relationship between silent reading comprehension and oral language at the beginning stages of reading has also been investigated. Ahlvers (1970) investigated the effects of giving children special instruction to improve intonation skills. She hypothesized that this training would result in higher reading comprehension scores at the end of grade one. The results of the testing showed no significant differences between those who received the training and those who did not, although this could be due to the fact that the training period lasted from November to February (early in the reading instruction) and the first tests were not carried out until over one month after instruction ended. It is not certain whether the instruction in intonation drills was properly designed for this sort of long-range transfer. Immediate testing might have shown different results.

Feinham (1969) investigated structural linguistic factors which she believed contribute to difficulty in reading comprehension of grade one readers. Her subjects were grade one black ghetto children who were involved in the Stanford Project in Computer-Assisted Instruction in Initial Reading. Feinham defined reading comprehension for this study as "the ability to select from a visually-presented sentence a one-word answer to an auditorally-presented question [p. 1]." She examined such factors as sentence length, word class and position, and sentence structure. Her most important finding was that the position in the sentence of the word giving the correct answer does influence comprehension. When the correct word occurred at the end of the sentence it was selected more accurately than a word presented in other positions. She concluded that when the answer-word is located in other positions there is interference or a piling-up of information for the child. She also found that when the correct answer was a noun the comprehension score was higher than for other classes of words.

These studies on silent reading comprehension have found in general, that comprehension is determined not only by the reader and his approach or flexibility as he matures, but also by what he is asked to read.

Silent and Oral Reading Comprehension

Recently the idea that oral and silent reading may require different processes has been suggested.

Goodman (1968) presents different models for mature oral reading and mature silent reading. He says, "In the early stages, oral and silent reading are probably quite comparable as processes [p. 18]." As reading becomes more proficient however, "the process of decoding directly from graphic input has become so habituated that the reader must first decode and then encode meaning as oral input. . . . The reader must be able to change his normal pace and his mode of information processing to encode orally at the same time he is decoding [p. 20]."

There are not very many studies investigating the relationship between oral and silent reading comprehension and most of these compare them only indirectly.

Morris (1970) examined oral and silent reading comprehension of grade four students, as they applied to basal readers, social studies material and science material. Although he was more interested in the difference in performance in content areas, he did find that "pupils' ability to comprehend materials read silently still lags behind their ability to comprehend materials orally [p. 85]." He felt that oral reading facility, oral reading comprehension and silent reading comprehension are each a distinctive form of reading behavior and that there is little direct relationship between them.

Means (1969) examined the relationship between reading comprehension and "the reader's use of the rhythms and melodies of normal speech in oral reading [p. 4]" at the grade four level. He did not hypothesize any relationship between oral and silent reading comprehension per se, and his conclusions were not concerned with this aspect, but the mean scores were higher for oral reading comprehension and seventy-five per cent of the children in the sample made a higher score on oral reading comprehension than on silent.

Eagan (1973) investigated the relationship between pausing while reading orally and oral and silent reading comprehension at the grade two and three level. She found that the number, length and placement of the pauses did have a significant and positive relationship to silent reading comprehension but almost none to oral comprehension. She found "no relationship at all between oral reading comprehension scores and silent reading comprehension scores [p. 209]." Overall means of the two comprehension scores were not available since means were only given in terms of ability-group placement. Although it is difficult to substantiate from the data as given, Eagan feels that children who were above average in silent reading comprehension were hampered by having to read orally. She feels that less proficient readers (and she includes younger readers, such as grade two) find oral reading an aid to comprehension; that they comprehend better when they can listen to themselves as they read.

Studies directly concerned with comparing oral and silent reading comprehension, especially at the beginning reading level, are necessary to investigate these few leads. Evidence seems to indicate that oral reading comprehension may be more effective at the beginning of the reading acquisition process, and that silent reading comprehension only becomes more effective as proficiency in reading increases. Just when this transition takes place, if it does, is a question for further research, and a question which has great implications for the classroom.

Studies Comparing Listening and Silent Reading Comprehension

Day and Beach (1966) surveyed research findings in this area and their statement after examining the studies was that "approximately half of the research has favored a visual, and half, an auditory method of presentation. It must then be concluded that neither an auditory nor visual presentation of information is more suited *per se* to efficient comprehension [p. 401]." They did caution however, that the studies were done under a wide range of conditions and are not strictly comparable. The conditions under which material is presented is a very important consideration too. Two important general conclusions they came to were that an auditory presentation (ie. listening) brings better comprehension at early ages (eg. age six), but a visual presentation (ie. reading) is more effective for comprehension for older children (eg. age sixteen). This trend appeared in many of the studies. The other important general conclusion was that comprehension of easy material was more effective with an auditory presentation, while difficult material was better understood when presented visually.

Barnard (1969) investigated the effects of different rates of an auditory presentation on both listening comprehension and reading comprehension (when students read along with the auditory presentation) and found that the rate of presentation did indeed affect comprehension.

Hampleman (1955) did an important study with 304 grade four and six students and his study is probably one on which Day and Beach based some of their general conclusions. He was mainly concerned with finding the relationships between listening and reading comprehension, the grade level differences, and the level of difficulty of the material used. He used paragraph comprehension and used two forms of the same instrument for the listening and reading tasks. His conclusions were that the listening comprehension was generally better for both grades although the older group scored higher on both tests, and also that when the material was easy, listening comprehension was also superior to reading.

Jones (1970) examined the effect of a listening accompaniment to silent reading at the grade four level to see if comprehension is thus improved. This was not a direct comparison of listening and reading comprehension, but her aim was to examine "the value of listening upon imagery, and how imagery and listening affect comprehension [p. 3]." She found that when students listen and read silently at the same time the mean scores in comprehension tests are higher but not significantly so.

An interesting study was done by Burrow (1969). He examined the relationship between listening and reading comprehension of ninety-six educable mentally retarded children from primary to high school age level. His view was that "the ability to comprehend information through listening is an antecedent level of language behavior to reading. It provides a logical addition to the processing system of the retardate who may not be ready to learn the higher level of skills involved in reading comprehension [p. 3]." Thus he sees the two as different rather than parallel processes. Burrow administered standardized tests of listening and reading comprehension. His conclusions were that listening comprehension was greater than reading comprehension and remained so throughout the age spread of the sample. He cautions that this is an atypical sample and should not necessarily be expected to follow the normal trend of reading comprehension surpassing listening comprehension as the students grow older.

Spearritt (1962) accomplished a monumental study on listening comprehension. He gave over 400 grade six students in Melbourne, Australia a battery of 34 tests and also examined their school examinations in reading, composition and arithmetic. Raw scores on these 37 variables were processed as a factor analysis problem to determine what factors are involved in listening comprehension and to establish whether a separate listening comprehension factor could be isolated. He also hypothesized that listening comprehension tests would have similar factor loadings to reading comprehension tests (especially on reasoning and verbal comprehension) but would be higher on attention and memory factors. On the basis of the analysis a separate listening comprehension factor was clearly identified. Its relationship to reading comprehension did not appear as hypothesized however. Reading comprehension had a much higher loading on the verbal comprehension factor than was anticipated, and listening comprehension did not have higher loadings on either attention or memory. He states that even though reading and listening comprehension tests differ in their factorial content, the correlations between equivalent tests of reading and listening comprehension ranged from .33 to .64 [p. 102]. This study adds further evidence to the theory that listening and reading comprehension are different but clearly related language processes.

A common thread in all these studies is that listening comprehension appears to be more effective at some point in the child's school experience. How much more effective it is, and for how long, are more questions for further research. The similarity in development and effectiveness between listening comprehension and oral reading comprehension might be worthwhile investigating as well.

Studies Comparing Listening, Oral Reading and Silent Reading Comprehension

An excellent study in this area was completed by Okada (1969). His research question was "Does the manner in which prose material is presented in a single exposure to a subject affect the comprehension of the information? [p. 2]." He used a 5x3x2x2 factorial design, involving five treatments, three ability groups of grade six students, two levels of difficulty of the material, and two methods of testing. There were 180 subjects. Treatments were: a strictly visual presentation (ie. silent reading), a strictly auditory presentation (ie. listening), a combined visual and auditory presentation (ie. silent reading with a listening accompaniment), a visual and vocal presentation (ie. oral reading), and a visual presentation with auditory blocking (ie. silent reading with noise in the background). He had four hypotheses; that neither mode of presentation, difficulty of the material, reading ability of the student, nor the mode of testing would have any significant effect on comprehension.

After a two-way and a four-way analysis of variance and covariance, hypotheses one and four were accepted and two and three were rejected. Thus his findings were that overall, the method of presentation and testing had no significant effect on reading comprehension, but the level of difficulty of the material and the ability of the student did. He did note a trend, concerning the difficulty of the materials:

> Concerning the EM (easy material) used in this study, it can be concluded that no significant advantages were found for any mode or modes of presenting information. . . . No significant treatment by silent reading ability interactions were evident implying that children who comprehend well or poorly under one condition do relatively the same under other learning conditions. . . .(However) treatment means were found to vary significantly for the DM (difficult material). The oral reading (V-A-Vo) technique was found to be significantly inferior to the A-V (listening and reading) and V (silent reading) techniques. A trend was also noted showing the A (listening) method inferior to the A-V and V methods for the difficult material [pp. 66-67].

Thus he found that silent reading comprehension (with or without the listening accompaniment) was more efficient at the grade six level for difficult material than either oral reading or listening comprehension alone.

An older study also at grade six level was done as part of the research project supervised by Strickland (1962). The students were given standardized tests of silent and oral reading comprehension and also a paper and pencil test of listening. Scores were correlated with the oral language patterns the individual child used. They found that children tended to score about the same on each of the kinds of comprehension tests, and that their high or low comprehension ability placement was related to the type of oral language patterns they used. Since the study was not concerned with the relationships among the three kinds of comprehension per se, the findings are of limited application here.

Investigations have examined the questions raised about the nature of comprehension. In looking at silent reading comprehension, studies have shown that reading is closely related to the language structures produced by the child. Studies that examined oral and silent reading have given some indication that oral reading is more effective for the beginning reader, silent for the proficient reader. Listening comprehension also seems to be more effective for the beginning readers than silent reading, but studies have not shown the relationship between listening and oral reading comprehension. The difficulty of the material is also of critical importance.

LISTENING COMPREHENSION AND READING COMPREHENSION

Recent theories have emphasized the distinction between the beginning and the fluent reader, and have become concerned with the importance of oral reading as an aural feedback to the reading process. Aural feedback raises the question of the place of listening comprehension in the beginning reading process.

An important question in reading research today is whether there is a single language comprehension process or whether reading comprehension is a unique thinking process therefore inherently different from the listening comprehension process. Reading has been placed in a broad context as one of the language processes, but its exact relationship to them is not yet clear.

Some see reading as the translation of graphic symbols to speech and reading comprehension, therefore, as the same process of comprehension as listening. "Reading is the translation from writing to a form of language from which the reader is already able to derive meaning." For the beginning reader this usually implies overt speech. (Venezky, 1972, p. 7).

Others see reading comprehension as a parallel but different form from other types of comprehension. "Reading is the active process of reconstructing meaning from language represented by graphic symbols (letters) just as listening is the active process of reconstructing meaning from the sound symbols (phonemes) of oral language. (Goodman, in Smith, Goodman & Meredith, 1970, p. 247)." A stronger statement of the same position comes from Wagner (1964) who claims that attempts to distinguish between the two forms of comprehension are artificial. She feels that the main distinction between them lies in the symbols used (written versus auditory) "to stimulate mental activity and linguistic response [p. 115]."

Many people would disagree that this is the main distinction. Goodman (1970) refers to oral language as being arranged in a time sequence while written language is arranged spatially, with intonation being replaced by punctuation. Burrow (1969) agrees with Goodman and adds the dimension of relevance to survival. To him, listening is an inherent skill, essential to the existance of man while reading has only tangential significance to survival through history. Anderson (1966) states that the main distinction between listening and reading is pace and who sets it. Listening is a socialized activity where another person sets the pace and often influences the listener by his style and personality as much as by his words. Reading is a personal, private activity, where the reader can pause to re-read, consider, ponder. Carroll (1971 a) adds that comprehension is multi-dimensional and that listening comprehension involves such factors as attention, motivation and auditory memory, while reading involves factors such as speed, intelligence and maturity of the reader.

Recent theories of reading comprehension (Goodman, 1968, 1970; Smith, 1971, 1973) have emphasized differences between the beginning or young reader and the mature or accomplished reader. The way in which the mature reader processes the printed material to achieve full understanding appears to be very different from a beginning reader. As Smith puts it, "the beginning reader has to acquire special skills that will be of very little use to him once he develops reading fluency [1971, p. 3]." He sees the process like this: (1971, p. 8).

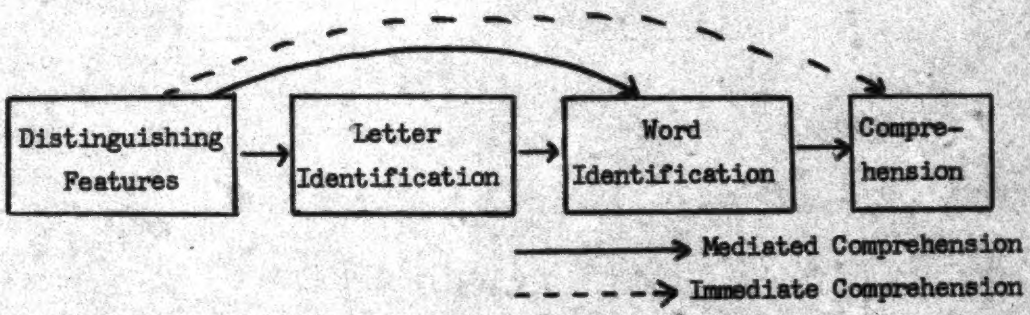

Distinguishing Features
Letter Identification
Word Identification
Compre-hension
Mediated Comprehension
Immediate Comprehension

FIGURE 1

SMITH'S MODEL OF COMPREHENSION

Goodman (1970) feels that, at the beginning, the child must recode the graphic input to an oral output which then provides for himself an auditory input or feedback which can then be decoded for meaning. His model [p. 17] follows:

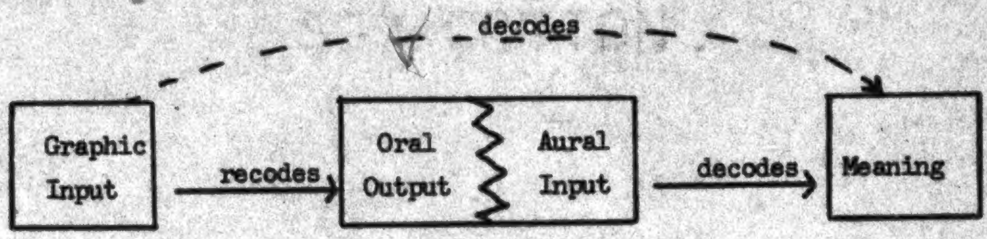

decodes
Graphic Input
recodes
Oral Output
Aural Input
decodes
Meaning

FIGURE 2

GOODMAN'S MODEL OF BEGINNING READING

Eventually the child gains experience, maturity, and proficiency and can then decode directly from the graphic symbols to meaning. Even at the early beginning stages, however, this direct decoding can occur, as noted by the broken line in the figure.

If reading comprehension and listening comprehension are similar processes, which reading schema (beginning or mature) does listening resemble? Goodman (1970, p.18) states, "reading does eventually become a parallel process to listening which would then have this appearance:

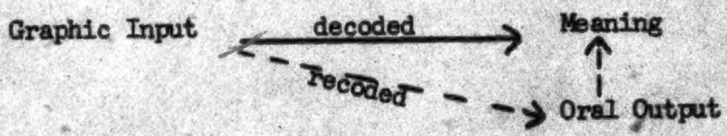

Graphic Input
decoded
Meaning
recoded
Oral Output

FIGURE 3

GOODMAN'S MODEL OF PROFICIENT READING

It is almost as if Goodman were saying that the child finds listening comprehension easier (having had so much more experience with it at the earlier stages of his life) and so he restructures the reading situation providing for himself an auditory input and thus making it into a listening comprehension situation until the reading process catches up with and parallels the listening process.

It is clear that the way in which the child receives the information he is to process is an important factor in his understanding of the message presented to him. Beginning readers are at a distinct disadvantage due to their lack of experience processing print, while being quite fluent and proficient in processing speech.

EFFECTS OF THE STIMULUS MATERIAL

Another important factor in a child's ability to process information is the nature of that information itself. Carroll (1971b) feels that if the message is beyond the individual's experience or level of conceptual development or his linguistic competence, he will not fully understand the intended message. Carroll states (1971b, p. 126):

> In the receptive skills, a most important variable in the performance of the individual is the overall level of difficulty inherent in the stimulus input. This sort of variable has been studied more extensively in the case of reading comprehension than in the case of listening comprehension.

Sentence Comprehension

What makes a sentence easy or difficult to understand? Gough (1971) states that Chomsky was the first to suggest that the meaning of a sentence is more than the sum of its parts and that, "the structure of the sentence contributes as much to its interpretation as its elements [p. 255]." From this emerged the briefly held theory that the more transformations applying to the underlying string, the more difficult the resulting sentence.

Smith (1970) found conflicting results. In her research with three- and four-year old children, the repetition technique was used to force children to restructure grammatical and ungrammatical versions of sentences. She examined seven structural types, each with three types of omission errors, and these seven were grouped on the basis of whether or not they occurred in the children's spontaneous speech. As shown (Smith, 1970, p. 123) they were:

A Structures (occurring spontaneously)	
Conjunction	(Sam and Harry built the house.)
Complement	(Susie likes to ride in the bus.)
Number	(Two of the marbles rolled away.)
B Structures (not occurring spontaneously)	
Adjective	(The little green frog jumped out.)
Relative	(The boy who was running fell down.)
Verbal Auxiliary	(Daddy may have missed the train.)
Conjunction Inversion	(Not Jane, but Mary, spilled the milk.)

The children listened to each sentence and then repeated it. Their repetitions were analyzed for accuracy when the stimulus sentence was grammatically correct, and for normalizations when the stimulus was ungrammatical.

A great discrepancy in their ability to repeat or normalize a sentence was noted between Structures A and B, those used spontaneously by the children and those not. Smith wondered what it was that distinguished the two groups of structures, both on the test and in the fact of their spontaneous occurrance. She felt it was not their transformational history.

> It does not explain, for instance, why sentences with relative clauses fell into one category (B stimuli)

> and sentences with complements fell into another (A stimuli); both are derived from two simplex sentences, and both involve embedding transformations [p. 129].

She concluded that the difference between the two groups was compression. A Structures had low compression, so that semantic information was quite evenly distributed through the sentence. B Structures had high compression, where semantic information was compressed or bunched together in the noun phrase or verb phrase. She states, "surface structure was the most important factor in determining whether a sentence was easy for the children to repeat accurately, and we assume, to understand [p. 132]."

Rommetveit (1968) examined the question of understanding of meaning from more of a psychological point of view, and more particularly, from the focus and function of the word. He felt that "neither grammatical structure nor strictly sequential constraints nor a combination of the two. . .[p. 240]" accounts fully for the conveyance of meaning. Neither approach to sentence production and sentence comprehension accounts for the phenomenon of "retroactive disambiguation of word meaning in sentence comprehension [p. 240]."

Thus it is not clear whether it is the application of certain transformations, the surface structure, the word meanings and semantic interpretation, or a combination of these with other factors which makes a sentence easy or difficult to understand.

The Deletion Transformation

This study has been based on a particular sentence type which may be described formally by the deletion transformation, as proposed in the Standard Model of transformational-generative grammar.

> The central idea of transformational grammar is that (surface structure and deep structure) are, in general, distinct and that the surface structure is determined by repeated application of certain formal operations called 'grammatical transformations' to objects of a more elementary sort. (Chomsky, 1965, pp. 16-17).

The basic operations which can be performed to determine surface structure are permutations, substitutions, deletion and addition. It is the group of optional deletion transformations which is of particular concern in this study.

Since, according to the theory, the application of a transformation may not change the meaning of a sentence, any elements which can be deleted can also be recovered. In this study it is assumed that either surface structure form relays the same content information and the same meaning to the listener or reader. However, it is possible that non-content semantic information may be transmitted by the different forms.

Slobin (1971) has proposed a series of linguistic universals based on studies of cognitive development and acquisition patterns of thirty languages in ten major families. With regards to optional deletions, he has found:

> Universal E5: It is easier to understand a complex sentence in which optionally deletable material appears in its full form. [p. 359].

This phenomenon has appeared in research with both adults and children, including Slobin's own research.

The question of linguistic universals, their existence and their form, has been debated by many people. Chomsky (1965) described them as "innate schemata that is rich, detailed, and specific enough to account for the fact of language acquisition [p. 27]." In other words, the child possesses innate knowledge of the organizational structure of language and from this can determine the specific learnings necessary in his linguistic community.

Derwing (1970) examined Chomsky's theory and compared its "content" orientation to the more traditional "process" orientation in which the universals are presented in the form of a learning algorithm or strategy. This is the type of approach suggested by Slobin (1971) in which he tries to relate linguistic and cognitive universals in terms of general learning principles as they apply to language acquisition. Derwing feels that this is still very much an open question.

Slobin's discussion (1971) of his Universal E5 includes an account of his own research on effects of deleted relative pronouns on the comprehension of young children. A two-year old girl could understand the appropriate underlying relations when a sentence given to her to repeat contained relative pronouns. However, he states, "at this stage of development the child is unable to interpret sentences from which the relative pronoun has been deleted. These structures were clearly beyond her competence at this level, and were treated as word lists [p. 360]."

Gough (1971) cites the work of Fodor, Garrett and Bever and also of Hakes and Cairns in relating the theory that the presence of the relative pronoun is a clue which guides the comprehender's guesses or hunches about the meaning as he processes the full sentence. This clue is a surface structure feature associated with a deep structure configuration.

> What Fodor, Garrett and Bever have proposed is that the comprehender is equipped with a set of heuristics or perceptual strategies which enable him, given an input string, to project possible deep structures for that string [p. 263].

Although Gough is not fully convinced of their position, he feels that it merits consideration.

Other studies have examined the effect of deletion produced structures. Menyuk (1961) was among the first to investigate the area of deletions. She analyzed children's production in spontaneous speech, in conversation with peers and in conversation with adults, to see what differences could be detected between children of age three and age seven. She found that there were significant differences between the two age groups for some of the transformations studied, but not for the conjunction deletion, as in "I see a lipstick and a comb". Almost all of the children at both age levels used it in their speech, although more of the older children than younger used it.

In another study, Menyuk (1969) notes that eighty-nine per cent of the two- to seven-year old children studied used a form of conjunction deletion in which the subject and verb of the second sentence are deleted, as in "I want the red crayon and the green crayon".

Fagan (1969) investigated the relationship between the presence and difficulty of transformations and sentence and passage difficulty for grade four, five and six students, using a cloze procedure. He found that embedding transformations were the best predictors of difficulty and that deletion transformations were also good predictors. These two seemed to influence difficulty of sentences and passages more than other transformations, perhaps because of their information-packing function. This was especially so for the Common Elements deletion, the Wh deletion, and the Wh-Be deletion, all of which were significant at the .01 level for all grades on both sentence and passage difficulty. The That + S Object deletion tended to be an exception to the trend, being among the fifteen easiest transformations at each grade level and in total. He states, "A greater percentage of the Deletion transformations than of any other group fell within the fifteen most difficult transformations for all grade groups. The two Deletion transformations which were consistently easy for all grades were the '(that) + S object', and the '(that) + S object quote' [p. 171]."

Cosens (1974) investigated the effect of deletion produced structures on the comprehension and word identification of grade one and two readers. She had 320 children in her sample. Comprehension was tested by a cloze procedure, and in tabulating the number of exact replacements a tendency for deletion produced structures to be more difficult than intact sentences was noted. Taken as a group, however, the differences between intact and deleted forms were not significant at the grade two level. There were significant differences in individual transformations favoring the intact form, and these transformations included the Be deletion, the performative deletion, the verb phrase deletion, the noun phrase deletion, and the noun phrase + verb + other elements deletion. She concluded that on the difficult items, reading comprehension was aided when the sentences were in intact form. The exception at the grade two level was the WH + Be deletion, where the intact form seemed more difficult than the deleted form. She felt that this may be due to difficulty with connectives.

The rank order of difficulty of the twelve deletions that Cosens investigated is given in Appendix A. Both grade one and two pupils found the verb phrase deletion and the (that) + S object deletion among the easiest.

There was also some evidence that children spontaneously changed the deletion produced structure to the intact form when they found the deleted form difficult. When there was no difference between the two forms in cloze performance there was also little evidence of spontaneous changes, either insertions or omissions of words affected by the deletion transformations. She concluded that:

> When intact and deleted sentence structures corresponding to each deletion transformation were compared in terms of number of exact replacements, there was a tendency for deletion produced structures to be more difficult than those with words inserted. Differences tended to favor the intact form of those deletion produced structures which were difficult for the pupils in this study. Addition of redundant contentive words appeared to aid comprehension . . . more than addition of syntactic markers [p. 160].

The effects of deletion have been examined in another way in the miscue research being carried out at Wayne State University. Y. Goodman (1971) describes one of the categories into which miscues are sorted as a transformation category. This category analyzes changes made in the text as children read, and compares the expected responses with the observed response. There are three main sub-categories; one in which there is a difference in deep structure between the two responses, one in which there is no change of deep structure but a change in surface strucure (often ungrammatical), and one in which the deep structure is the same but the surface structure has been generated by an alternate option. Miscues in this third sub-category which would result from an application of an optional deletion transformation.

In her longitudinal study of four children, Y. Goodman (1971) noted a trend toward a greater number of alternate options for the average readers as compared to the slow readers. This may have been due to their greater proficiency in reading or to the material they were exposed to.

This question was also examined by Burke (1969) in her attempt to describe the grammatical restructurings in the oral reading of grade six students. She worked with six students who were reading one year or more above their grade level.

Burke found that the children ranged between 2.4 and 5.2 miscues per hundred words, and fify-three per cent of these miscues were of the restructuring or transforming type. There appeared to be no relationship between the number of miscues and comprehension. In the third subcategory, the use of alternate options, miscues tended to be insertion and deletion of conjunctions, clause markers, and determiners in noun phrases. The subjects did not tend to be consistent in their optional restructurings and Burke states:

> Miscues in this category are seldom disruptive of text or meaning. It may be that their numbers will increase or decrease with differences in the developmental level of the reader, the consistency of the author and the idiomatic preferences of the author and the reader [p. 169-179].

Reading miscues of this kind do not appear to be a serious problem for a reader and would not seem to interfere with comprehension.

SUMMARY

Comprehension appears to be a two stage process for both listening and reading. The first stage is decoding or identification, a sorting and recognition stage, and the second is attaching or gaining of the meaning, a relating and evaluation stage where predictions are confirmed or rejected.

Research in silent reading comprehension has shown that both the flexibility and maturity of the reader and the nature of the material he is asked to read are important factors in comprehension. Studies that examined oral and silent reading seem to indicate that oral reading is more effective for the beginning reader, silent reading for the more proficient reader. Listening comprehension also seems to be more effective for young children, and for most elementary school age children when the material is easy.

The distinction between beginning and proficient readers is important since the processes appear to be different. Studies also indicate a possible relationship between oral reading and listening for the beginning reader.

There appear to be many possible sources of difficulty in the stimulus material. Sentences have been thought to be easy or difficult to understand due to their transformational type, to the amount of compression of information, or possibly due to the words themselves and their semantic and cognitive implications.

One type of sentence that has been studied is described formally by the deletion transformation. Of all the sentence types, those involving deletable material appear to be among the most difficult, and when children find them difficult their comprehension seems better when they are presented with the intact form.

Three factors emerge from the literature as being important to any consideration of comprehension. The first is the individual himself and his maturity, flexibility and experience. The second is the manner of presentation of the information, particularly listening or reading tasks. The third is the level of difficulty of the material which he is asked to process.

CHAPTER III

THE EXPERIMENTAL DESIGN

The design of the study is a basic 2x2 factorial employing two treatments (listening and reading) and two sentence types (deleted form and nondeleted form). Since each subject received both treatments and both sentence types, he appeared in each of the four cells. Therefore the analysis was carried out four times, as though four separate tests were administered with each subject occupying only one of the cells each time.

THE LISTENING-READING COMPREHENSION TEST

The test was based on the one devised by Cosens (1974). Her test passages and questions were taken from stories in the Ginn Basic Readers but were rewritten to include the twelve deletion transformations she chose to test. These transformations, examples of them, and their frequency of occurrence in the Ginn Basic Readers may be found in Appendix B. Cosens' reading comprehension instrument was a cloze test. This type of test has proven suitable for measuring reading comprehension, but is unsuitable for measuring listening comprehension for young children.

It was decided therefore to change the format of the test to a question and answer type. The pupil would respond orally and the response would then be recorded by the examiner. In changing the format, difficulties were encountered with some of the transformations, and some of them were dropped from the study.

Transformations Eliminated From The Test

Be Deletion. (Example: A toy airplane [is] in the window!). This sentence pattern was not a frequent one in the series chosen; at the grade one and two level it ranged between 1.9 per cent and 7.0 per cent. The major difficulty with this transformation was that it was impossible to construct a question of the chosen format without including the deleted element. It was therefore eliminated from the study.

Performative Deletion. (Example: Up, up, up [it went]). This pattern ranged from 2.3 per cent to 4.3 per cent at the grade one and two levels, being highest at the preprimer level and decreasing steadily from then on. It was also impossible to construct a question which would not include deleted words and, like the Be deletion, was eliminated from the study.

Imperative Deletion. (Example: [You] look at the clown wave). While it was possible to construct a question, a problem arose due to the referent intended by the pro form [You]. For example, for the above sentence, the question "Who should look at the clown wave?" could be presented. However, there seem to be two levels of understanding for this question. A child may know that in the sentence, "Look at the clown wave" someone is being spoken to and he may be able to supply the word "you" or "someone". However, in the context of a story, the identity of the person is clear, and so the child may also be able to identify the person intended. Since complete understanding of the sentence involves more information than that given in the sentence alone, this transformation was eliminated even though it was a very frequent one at between 16.1 and 80.7 percent.

Comparative Deletion. (Example: An airplane can go faster than a train [can go]). This was a transformation for which a question could be constructed but the question became more difficult to understand than the original sentence. For example, for the sentence above the question would be "What can a train do?" or even "A train can do what?". It is difficult to know what is really being asked and to answer in a way that makes sense. This objection was raised by both adults and grade one and two children who were asked to try the questions while the test was being constructed. As this was also a rather infrequent pattern (between 0 and 5.7 per cent), it was eliminated from the study.

Infinitive Deletion. (Example: I will help you [to] catch that pancake). Cosens included this transformation even though it occurred only 0.02 to 2.2 per cent of the time. She conceded that it was a very particular case and only applied to the verb "help". Because of this and its lack of frequency, this transformation was dropped from this study.

Summary. Five of the twelve deletion transformations that Cosens examined were dropped from this study due to difficulties arising in constructing new test items and/or their lack of frequency.

Transformations Remaining in the Test

The remaining transformations seemed to fall into two distinct categories, those operating on conjoined sentences and those operating on embedded sentences. There were three transformations which operated on conjoined sentences and they were the Equi-Noun Phrase Deletion, the Equi-Verb Phrase Deletion and the Equi-Noun Phrase Plus Other Elements

Deletion. Taken together, the three conjoining deletion transformations follow this pattern:

$$[X\ A\ Y]_S\ C\ [W\ A\ Z]_S$$

$$\begin{array}{ccccccc} 1&2&3&4&5&6&7\\ 1&2&3&4&5&\emptyset&7 \end{array}\qquad \text{Condition: } 2 = 6$$

It was thought that by studying these three deletion transformations separately, more information would be available and trends might by more visible which would not be differentiated if they were treated as one basic deletion operation. There were also three which operated on embedded sentences and they were the WH Deletion, the WH Plus Be Deletion and the (That) Plus S as Object Deletion.

Equi-Noun Phrase Deletion. (Example: The dog ran after the pancake but [the dog] could not catch it). In this transformation, the complete noun phrase is deleted from the second string.

$$[X\ NP\ Y]_S\ C\ [W\ NP\ Z]_S$$

$$\begin{array}{ccccccc} 1&2&3&4&5&6&7\\ 1&2&3&4&5&\emptyset&7 \end{array}\qquad \text{Condition: } 2 = 6$$

Cosens found this transformation to be significantly more difficult in deleted form at the grade two level and found the same trend although not significant at the grade one level. Its frequency ranged from 0.02 per cent to 14.0 per cent.

Equi-Verb Phrase Deletion. (Example: Betty [ran up the street] and Nan ran up the street). In this transformation, the complete verb phrase is deleted from the first string.

$$[NP\ X\ VP]_S\ C\ [NP\ Y\ VP]_S$$

$$\begin{array}{ccccc} 1&2&3&4&5\\ 1&\emptyset&3&4&5 \end{array}\qquad \text{Condition: } 2 = 5$$

This one was also more difficult in deleted form, significant at the grade two level but not at grade one. Its frequency at grade one and two level ranged between 1.6 and 10.2 per cent.

Equi-Noun Phrase Plus Other Elements Deletion. (Example: The children were running and [the children were] skipping). Occasionally other elements which are common to both sentences are deleted when the sentences are conjoined. Cosens examined two types of this deletion, which she called the NP + AUX (VERB) and the NP + VERB + Other Elements Deletions. In both of them, the deleted parts include the noun phrase and also elements of the verb phrase. Since the difference between the two types is not as readily distinguishable as the other two conjoining deletions, and since their derivations are so similar (as shown in Appendix C), it was decided for the purposes of this study to treat these as one basic operation. Both can be achieved by the rule:

```
[NP  [AUX V X Y ] ] C [NP  [AUX  V  X  Z ] ]
S   VP         VP S   S   VP             VP S
  1    2  3 4 5     6   7    8   9 10 11
  1    2  3 4 5     6   Ø    Ø  (Ø) Ø 11
                      Condition: 1=7, 2=8, 3=9, 4=10
```

Cosens found that both were more difficult in deleted form than intact, the NP + AUX (VERB) Deletion was not significant but the NP + VERB + Other Elements Deletion was significant at both levels. Their frequency was as follows:

NP + AUX (V)	4.0	11.1	7.1	11.8	18.7	10.3	16.1
NP + V + Other	1.5	5.0	4.3	8.1	7.9	12.0	14.5
	5.5	16.1	11.4	19.9	25.6	22.3	30.6

Combined range: between 5.5 and 25.6 per cent (grade one and two level).

__WH Deletion__. (Example: There is the ball [that] the dog wants to play with). The rule for this transformation which operates on embedded sentences is:

$$\begin{array}{llll} NP\ [_{S}\ [_{NP} & WH\ PROj\ X\ ]_{NP} & NP & Y\ ]_{S} \\ 1 & 2 & 3 & 4 \\ 1 & \emptyset & 3 & 4 \end{array}$$

Cosens found no trend on the difficulty of this transformation.

__WH Plus Be Deletion__. (Example: A dog [which was] at the foot of the hill saw the Pancake Man). This transformation follows the rule:

$$\begin{array}{llll} NP\ [_{S}\ [_{NP} & WH\ PROj\ X\ ]_{NP} & [be\ T] & Y\ ]_{S} \\ 1 & 2 & 3 & 4 \\ 1 & \emptyset & \emptyset & 4 \end{array}$$

Cosens found this transformation to be easier in deleted form, contrary to the general trend.

__(That) Plus S as Object Deletion__. (Example: I know [that] I can run up that hill). The rule is:

$$\begin{array}{lll} V & that & [_{S}\ X\ ]_{S} \\ 1 & 2 & 3 \\ 1 & \emptyset & 3 \end{array}$$

Cosens found this to be easier in deleted form than intact, similar to the WH + Be Deletion. It also ranked as the easiest of the deletions tested at grade one, and second easiest at grade two. Fagan (1969) also found this to be an easy transformation.

__Summary__. The six transformations included in this study accounted for the following percentages of the deletions found in the __Ginn Basic Readers__, the series on which the test passages were based.

PP	P	1	2^1	2^2
12.7	49.7	41.6	58.6	72.4

With the exception of the Imperative Deletion transformation (ranging from 80.7 per cent at the PP level to 16.2 per cent at the 2^2 level), the excluded transformations only accounted for about ten per cent in all.

The passages were re-constructed to account for changes made in the test and were written so that in every version deleted and nondeleted forms alternated through the passage. The questions were designed so as to elicit a response which would include the deletable material.without providing a clue by repeating those words in the question.

WORD RECOGNITION TEST

All of the words included in the test passages were listed randomly and presented to the children as part of the screening procedure. When the same basic word had two forms (for example, clown and clowns, or look and looked), only the more complex form was used on the test in order to limit the length of the test as much as possible. There were 141 words on the test, and the children were asked to read the list aloud. Self-corrected responses were counted as correct, but partially correct responses were counted incorrect. For example, the word "looked" read as "look" was counted incorrect. The test in included in Appendix D.

PILOT STUDY

A pilot study was conducted in mid March in order to determine the feasibility of the study as originally planned, to finalize test items, and to examine the trend of the responses.

A total of eighty-seven children were screened, forty-three in grade one and forty-four in grade two. It was felt that a score of ninety per cent on the Word Recognition Test would be an adequate score for eligibility in the sample. It is low enough that a large number of children would remain in the population making random selection more effective, and it is high enough to minimize word recognition difficulties on the reading comprehension test. This is because it is easier to recognize words when they are in the context of a story, since children have added semantic and syntactic clues to add to their knowledge of sound-symbol relationships (Goodman, 1965). Thus it can be supposed that if they can pronounce ninety per cent of the words in isolation, they would be likely able to pronounce ninety-five per cent of them in context, and ninety-five per cent is considered a child's independent reading level.

Difficulties arose with this standard at the grade one level when teacher ratings of the students' general achievement were considered, as can be seen in the following table.

No. of Children	No. at 90%	Type	No. at 75%	Type
grade one - 43	6	H - 6	13	H - 13
grade two - 44	31	H - 9 A - 19 L - 3		

H = high A = average L = Low (achievement)

The difference between the two grades is obvious from the table. Very few grade one children were able to score at the ninety per cent level. Of those who did, all were considered by their teachers to be high-achievers. When the standard was lowered to seventy-five per cent, there were still very few, and again, all were considered to be at least high-average achievers. On the other hand, the grade two children who could read ninety per cent of the list included a range from low- to high-achievers.

There was also a grade-level difference in the manner of responding. The grade one children tended to either know the word or not. They did not tend to guess at an unknown word, even when pressed to do so. As a whole, they appeared to be in the no-response stage of reading development (Biemiller, 1970; Fleming, 1974). Grade two children, on the other hand, were more willing to guess and could usually use the orthographic clues available.

Since they seemed to be two entirely different populations, it was decided to eliminate one group from the study. In view of the minimum score considered necessary to ensure minimal word recognition difficulties, it was decided that grade two would remain in the study and that grade one would be eliminated.

Both grades one and two were tested as planned on the pilot study however, in order to further examine the Listening-Reading Comprehension Test. The subjects were randomly selected from among those scoring seventy-five per cent or above on the Word Recognition Test in grade one and those scoring ninety per cent or above in grade two. Ten were selected in each grade.

Each of the children read a story orally and listened to a story on tape. After the full story each test sentence was repeated, followed immediately by the test question, to which the child responded orally. The time necessary for each child to complete the tests averaged from about ten to fifteen minutes. Analysis of the results showed a slight but nonsignificant trend toward a higher mean on deleted forms on both the listening and reading tasks. On the basis of information obtained from the pilot study, changes were made in some of the test items.

VALIDITY

The Listening-Reading Comprehension Test was constructed in order to measure grade two students' comprehension of specific sentence structures in passages which were to be presented orally in a listening situation and visually in a reading situation.

The six structures included in the test were produced by application of the deletion transformation as defined in transformational grammar, and they were taken from the test devised by Cosens (1974).

Two versions of each of the two passages were written so as to test the effect of both deleted and nondeleted forms of the sentence, and these forms were balanced and alternated within each passage.

The test questions were constructed so as to focus on the deletable material through the use of WH-questions to which the subjects would respond orally. The questions were also submitted to the scrutiny of a graduate research seminar in the Linguistics Department, University of Alberta, for evaluation and suggestions, and the passages and test questions were further revised on the basis of the comments received at that time.

The passages were read or listened to by the subjects, and the test sentences were presented again, one at a time. After each, all of the subjects saw and heard the test question, so that the administration of the test questions was identical for all subjects.

For these reasons, content validity is claimed for this research instrument.

RELIABILITY

Reliability was considered in terms of how consistently the instrument evoked the same response from individuals. It was measured by a test-retest method, and involved ten subjects. Test and retest scores were compiled according to the structures included on the test. The graphs in Figure 4 indicate the consistency of the scores over the period of time between the two tests. It appeared that the research instrument was slightly more reliable as a listening test than as a reading test, although the pattern of responses was very similar in both cases.

THE SAMPLE

The subjects of this investigation were selected from the grade two students in three Edmonton Public Schools. The schools were considered by the Edmonton Public School Board to be of comparable size and socio-economic level, that being middle-class.

A total of 206 grade two children were screened on the following criteria:

1. They were in their second year of school, having repeated no grades.

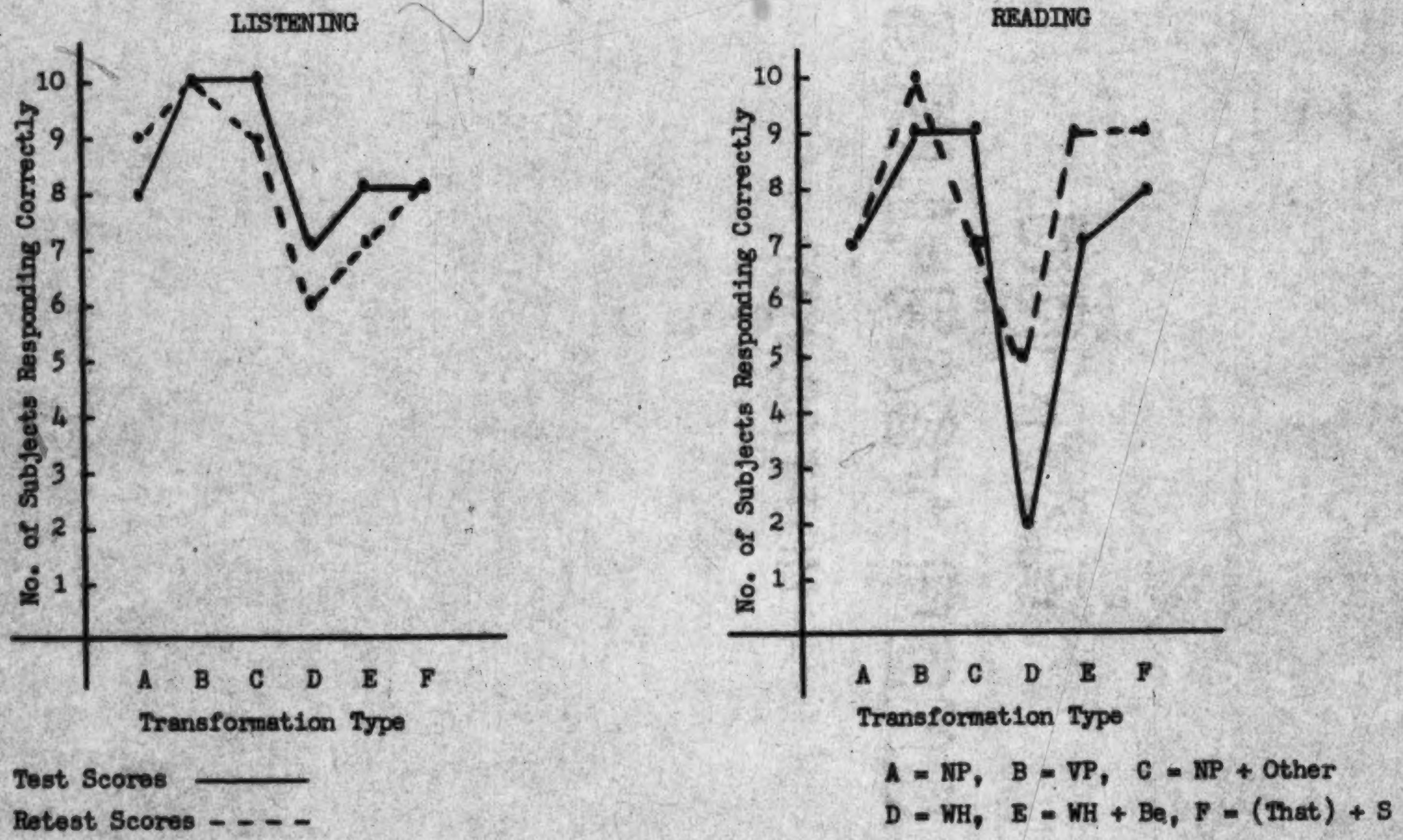


FIGURE 4

TEST-RETEST RELIABILITY GRAPHS

2. They were not learning English as a second language.
3. They had no noticeable uncorrected vision or hearing difficulties.
4. They were not receiving instruction in the Ginn Basic Readers although in two of the schools, other classes were reading in this series.
5. They scored ninety per cent or more on the Word Recognition Test.

Screening took place at the end of March and beginning of April, 1974. The children were taken out of the class individually and asked to read the list of words on the Word Recognition Test out loud. For the other screening criteria, teachers were asked to check school records and/or ask or observe the children for the information. Often the same child was eliminated from the population on two or more of the criteria. After screening, a total of 107 children remained in the population. A table of random numbers was used to select the sample after screening was completed. The forty-eight children selected were randomly assigned to one of four groups which determined the version of each passage they would be exposed to and the treatment for each passage. The assignment of subjects to groups is shown in Figure 5 and is expanded in Appendix E.

TESTING PROCEDURE

Testing took place at the end of April and the beginning of May, 1974. The subjects were tested individually and whether they received the listening or reading treatment first was alternated with each subject.

In the reading treatment, the subjects were told that they

Analysis One
Story A

	N	D
L	Version 1 questions 1, 3, 5 X	Version 2 questions 1, 3, 5 Y
R	Version 1 questions 1, 3, 5 Z	Version 2 questions 1, 3, 5 Q

Analysis Two
Story A

	N	D
L	Version 2 questions 2, 4, 6 Y	Version 1 questions 2, 4, 6 X
R	Version 2 questions 2, 4, 6 Q	Version 1 questions 2, 4, 6 Z

Analysis Three
Story B

	N	D
L	Version 1 questions 1, 3, 5 Q	Version 2 questions 1, 3, 5 Z
R	Version 1 questions 1, 3, 5 Y	Version 2 questions 1, 3, 5 X

Analysis Four
Story B

	N	D
L	Version 2 questions 2, 4, 6 Z	Version 1 questions 2, 4, 6 Q
R	Version 2 questions 2, 4, 6 X	Version 1 questions 2, 4, 6 Y

X, Y, Z, and Q represent blocks of subjects and included so as to indicate the task completed by each group of subjects for each analysis.

FIGURE 5

ORGANIZATION OF TEST ITEMS
FOR ANALYSIS

would first read the story aloud and after they finished they would read some of the sentences from the story again and answer a question about each sentence. Each subject was then given a booklet containing the full story followed by a reprint of the six sentences to be questioned, each on a separate page. Primary size type was used. The subject read the full story orally and then read the six sentences. The test questions were in a separate booklet. As the subject reread each sentence, the test question was then placed over the sentence he had just read and the question was also read aloud to him.

In the listening treatment, the subject listened to the full story on tape, then heard each of the six sentences again. After each sentence, the tape was stopped and the test question in the booklet was placed in front of the subject and the question was also read to him.

The subject's responses were taped and recorded by the examiner as the subject gave them. The average time needed for each subject to complete both listening and reading tasks was about ten minutes.

ANALYSIS OF THE DATA

Four two-way analyses of variance were carried out to examine the results of the basic 2x2 factorial design. Scheffe tests were also computed in order to compare the means of the cells in each of the four analyses. In addition, each of the six sentence types were examined in an item analysis to determine the relative ease or difficulty of each of the deletion transformations. Achievement scores were taken from the Stanford Achievement Test, Primary II Form Y, administered to all grade two children in the school system in May, 1974. Coefficients of correlation were computed between scores on the research instrument and subscores of the Stanford Achievement Test. The oral reading of the passages and test sentences was analyzed for spontaneous restructuring miscues as discussed by Y. Goodman (1971).

CHAPTER IV

ANALYSIS OF THE DATA

The purpose of this chapter is to present the findings of the experiment. The findings are presented in the following order:

1. A comparison of overall listening and reading scores.
2. A comparison of overall scores on deleted and nondeleted items.
3. Interaction effects.
4. An analysis of the items on the test.
5. A comparison of cell means within each analysis.
6. A comparison of the scores on the research instrument and the Stanford Achievement Test.
7. An analysis of spontaneous restructuring during oral reading.

LISTENING AND READING SCORES

The primary analysis of data was a two-way analysis of variance carried out four times. The organization of the analysis is shown in Appendix E. Although the pattern was not consistent from one analysis to the next, the combined means showed a trend for listening scores to be generally higher than reading scores, as shown in Table I. Table II, which shows the detailed analysis, indicates that only one of the four analyses showed a trend toward higher listening scores over reading and this trend was not significant.

TABLE I

MEANS AND STANDARD DEVIATIONS OF THE LISTENING-READING COMPREHENSION TEST

Task	Combined Mean	Analysis 1		Analysis 2		Analysis 3		Analysis 4	
		Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Listening - nondeleted	2.40	2.16	.83	2.08	.90	2.75	.62	2.58	.67
Listening - deleted	2.29	2.58	.67	2.08	.51	2.83	.39	1.67	1.15
Reading - nondeleted	2.27	2.75	.62	1.58	.67	2.91	.29	1.83	.83
Reading - deleted	2.06	2.08	.67	1.91	.29	2.22	.97	2.00	.74

Possible total of the mean = 3.00

TABLE II

ANALYSIS OF VARIANCE RESULTS

Analysis	Source	S.S.	df	M.S.	F
Analysis One	Between Listening and Reading	2.075	1	2.075	.839
	Between Nondeleted and Deleted	.188	1	.188	.329
	Interaction Effect	3.521	1	3.521	7.121*
	Within Groups	21.750	44	.494	
Analysis Two	Between Listening and Reading	1.333	1	1.333	3.321
	Between Nondeleted and Deleted	.333	1	.333	.830
	Interaction Effect	.333	1	.333	.830
	Within Groups	17.667	44	.402	
Analysis Three	Between Listening and Reading	.521	1	.521	.689
	Between Nondeleted and Deleted	1.021	1	1.021	2.629
	Interaction Effect	1.687	1	1.687	4.346*
	Within Groups	17.084	44	.388	
Analysis Four	Between Listening and Reading	.521	1	.521	.689
	Between Nondeleted and Deleted	1.688	1	1.688	2.233
	Interaction Effect	3.521	1	3.521	4.659*
	Within Groups	33.250	44	.756	

* Probability = .05 when F = 4.06 (1,44)

Since the differences between listening and reading scores were not significant, it appears that similar processes may be operating when material is presented in different ways. It is possible that other factors, such as the ease or difficulty of the material or individual differences may have had an effect on the comprehension scores, since the pattern of responses as illustrated in Figure 6 was an unexpected one.

SCORES ON DELETED AND NONDELETED ITEMS

As can be seen in Table I, the combined means show a trend toward higher scores on the nondeleted items for each of the treatments. The trend however, is not consistent for each of the four analyses. This trend can be more clearly seen in the following table.

Listening - nondeleted mean = 2.39	Listening - deleted mean - 2.29
Reading - nondeleted mean = 2.27	Reading - deleted mean - 2.06

Neither the trend toward higher listening scores nor the trend toward higher scores on nondeleted items were significant, as indicated in Table II.

INTERACTION EFFECTS

Table II presents the results of the analysis of variance.

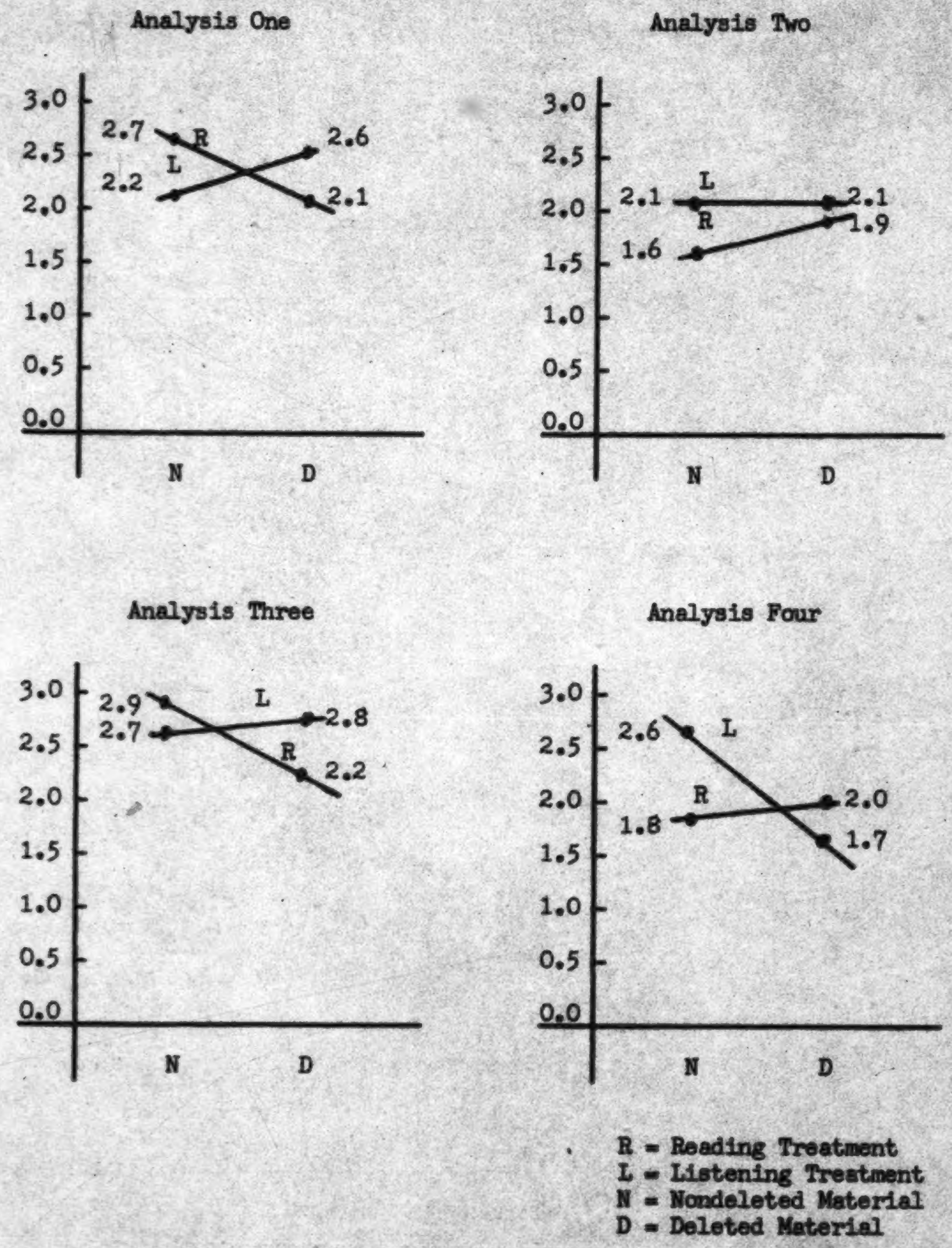


FIGURE 6

INTERACTION GRAPHS

As previously stated, there were no significant differences between the main effects of listening and reading or deleted and nondeleted material. There were significant differences when interaction was considered. Three of the four analyses indicated significant interaction at the .05 level. Thus it appears that the relationship between the mode of presentation of material and the nature of the material itself is not a simple one as it relates to a child's understanding. This is even more evident when graphs of the interaction effects are considered in Figure 6. In the first and third analyses, the reading scores were higher than listening scores on nondeleted items and lower than listening scores on deleted items. However, on analyses two and four, the listening scores were higher on the nondeleted items.

This seems to indicate that on two of the analyses, reading comprehension scores were higher when the material was nondeleted and on the other two, reading comprehension scores were higher when material was deleted. Listening comprehension seemed to follow the same pattern. Since Analyses One and Two were from Story A and Analyses Three and Four were from Story B, this apparent inconsistency did not appear to be related to passage difficulty. Analyses One and Three were concerned with questions one, three and five of the test and Analyses Two and Four were concerned with questions two, four and six of the test (Figure 5). Therefore the different trends appeared to be related to the structures tested.

ANALYSIS OF THE ITEMS

Each of the six types of deletion transformation included in this study was examined in each of the treatments to determine the percentage of the subjects who gave a correct response for each one. The results are shown in Table III.

There appeared to be fairly great differences between the transformations in the total results and also in the results with each treatment. The Verb Phrase deletion, for example, appeared to be consistently easy across each of the tasks and in the total percentage. Others, like the Wh deletion and the Wh + Be deletion showed a great deal of variation from one task to another and appeared to be more difficult on the total results. The Wh deletion appeared to be more difficult in a reading situation as opposed to a listening situation.

The transformations are ranked according to their difficulty in Table IV and their consistency across the tasks is also noted.

The Verb Phrase deletion was the easiest of the six, followed by the (That) + S deletion and then the Noun Phrase + Other Elements deletion. Fourth was the Noun Phrase deletion, and fifth was the Wh + Be deletion. Consistently the most difficult was the Wh deletion.

The (That) + S deletion was found to be consistently easy by both Fagan (1969) and Cosens (1974). Fagan hypothesised that this was a structure which was familiar to the children and common in their oral language. If this is so, then the fact that it proves to

TABLE III

RELATIVE DIFFICULTY OF EACH TRANSFORMATION

Transformation	Total Test	Listening-nondeleted		Listening-deleted		Reading-nondeleted		Reading-deleted	
		Percent Correct	Biserial Correlation	Percent Correct	Biserial Corr.	Percent Correct	Biserial Corr.	Percent Correct	Biserial Corr.
Noun Phrase deletion	80.2%	79.2	.371	75.0	.192	87.6	.355	79.2	.005
Verb Phrase deletion	95.8%	100.0	−.151	95.8	.153	95.8	−.176	91.6	.408
Noun Phrase Plus Other Elements deletion	86.4%	75.0	−.126	100.0	.454	95.8	.506	75.0	.060
WH deletion	36.4%	58.4	.657	37.6	.360	25.0	.330	25.0	.428
WH + Be deletion	66.6%	75.0	.617	62.6	.067	58.4	.012	70.8	.441
(that) + S deletion	88.6%	97.6	−.099	95.8	.531	95.8	.456	75.0	.037

TABLE IV

RANK ORDER OF DIFFICULTY OF THE TRANSFORMATIONS

Rank: Easiest to Hardest	Total Test	Listening-nondeleted	Listening-deleted	Reading-nondeleted	Reading-deleted
1.	Verb Phrase (95.8%)	Verb Phrase	Noun Phrase Plus Other Elements	Verb Phrase, Noun Phrase Plus Other Elements, (That) + S	Verb Phrase
2.	(That) + S (88.6%)	(That) + S	Verb Phrase, (That) + S		Noun Phrase
3.	Noun Phrase Plus Other Elements (86.4%)	Noun Phrase			Noun Phrase + Other Elements (That) + S
4.	Noun Phrase (80.2%)	Noun Phrase + Other Elements, WH + Be	Noun Phrase	Noun Phrase	
5.	WH + Be (66.6%)		WH + Be	WH + Be	WH + Be
6.	WH (36.4%)	WH	WH	WH	WH

be consistently easy in reading comprehension lends support to the findings of Ruddell (1963) and Tatham (1968 a and b) that comprehension is improved when children are asked to read material which reflects their own oral patterns.

This finding has implications for the analysis of the graphs in Figure 6. The figure in Appendix E illustrates the transformations included in each analysis. They are also given below in Table V.

TABLE V

TRANSFORMATIONS INCLUDED IN EACH ANALYSIS

Analysis One (Story A)	Analysis Two (Story A)
No. 1 NP + Other	No. 2 WH
No. 3 (That) + S	No. 4 WH + Be
No. 5 NP	No. 6 VP
Analysis Three (Story B)	**Analysis Four (Story B)**
No. 1 (That) + S	No. 2 WH
No. 3 VP	No. 4 NP
No. 5 NP + Other	No. 6 WH + Be

Analysis Three contains the three easiest transformations, while Analysis Four contains the three most difficult ones. Analysis One is very similar to Analysis Three, and Analysis Two is very similar to Analysis Four. The differing factor is the Noun Phrase and Verb Phrase. Thus it appears that the interaction which occurred seems to depend at least in part on the level of difficulty of the items themselves. On the easy transformations, it appears that children understand the nondeleted version better when they read, but understand the deleted version better when they listen. On the difficult transformations there is an opposite trend. The children appeared to understand the nondeleted version better when they listened to it. When they read the difficult transformations their understanding seemed better on the deleted version. These findings do not agree with those of Cosens, who found that on difficult items, reading comprehension was better when the sentence was intact.

A COMPARISON OF CELL MEANS WITHIN EACH ANALYSIS

In order to further examine the interaction results, and to see just where the significance between the scores lay, Scheffe tests were computed to compare the means of each of the cells in each block. The results are indicated in Table VI.

Comparing listening and reading scores on nondeleted items, the difference between the scores was significant at the .05 level on three of the four analyses. The fourth showed a strong trend but it was not significant. Within the group of comparisons, the significant difference favored the reading scores on easy transformations and the listening scores on difficult transformations.

Comparing listening and reading scores on deleted items, there was no significant difference on the difficult transformations but there was a trend favoring listening scores on the easier transformations, and one of the analyses was significant at the .05 level.

In examining the difference between nondeleted and deleted items for listening and for reading, the results seemed to favor the nondeleted items. On easy transformations, nondeleted scores were significantly higher than deleted scores on the reading tasks. On difficult transformations, nondeleted scores were significantly higher on the

5

TABLE VI

RESULTS OF SCHEFFE TESTS COMPARING CELL MEANS

Analysis One	Analysis Two
Ln - Ld F = 2.107 (Ld higher)	Ln - Ld F = 0.000 (no difference)
Rn - Rd F = 5.395 (Rn higher)*	Rn - Rd F = 1.646 (Rd higher)
Ln - Rn F = 4.118 (Rn higher)*	Ln - Rn F = 3.736 (Ln higher)
Ld - Rd F = 3.034 (Ld higher)	Ld - Rd F = 0.415 (Ld higher)
Analysis Three	**Analysis Four**
Ln - Ld F = 0.107 (Ld higher)	Ln - Ld F = 6.672 (Ln higher)*
Rn - Rd F = 6.868 (Rn higher)*	Rn - Rd F = 1.544 (Rd higher)
Ln - Rn F = 4.292 (Rn higher)*	Ln - Rn F = 4.458 (Ln higher)*
Ld - Rd F = 5.261 (Ld higher)*	Ld - Rd F = 0.882 (Rd higher)

* Probability = .05 when F = 4.06

Ln = Listening nondeleted
Ld = Listening deleted
Rn = Reading nondeleted
Rd = Reading deleted

listening task on one of the analyses.

From these results it apprears that where there are significant differences between nondeleted and deleted forms, these differences favor the nondeleted form. There were no instances of significance favoring deleted forms. In examining nondeleted items across listening and reading separately, results appeared to depend on the ease or difficulty of the item. On easy transformations, reading scores were significantly higher, and on difficult transformations, listening scores were significantly higher. To a lesser extent, this dependence on ease or difficulty of the transformations also appeared evident on the analysis of deleted items across tasks. However, the trend is a different one than for nondeleted items. On easy transformations, the listening scores tended to be higher than reading scores. There appeared to be no trend on difficult transformations.

COMPARISON OF GENERAL READING ACHIEVEMENT AND SCORES ON RESEARCH INSTRUMENT

All of the subjects in the study were given the Stanford Achievement Test Primary II Form Y. Correlation coefficients were calculated between scores on the research instrument and two of the subtests of the Stanford Test. The results are indicated in Tables VI and VII. Scores from the Word Meaning Test and the Paragraph Meaning Test were taken from the Stanford Achievement Test. They were compared with both the total listening and reading scores from the experiment and with the four subscores (listening-nondeleted, listening-deleted, reading-nondeleted, and reading-deleted).

As indicated in Table VII there was a significant correlation

TABLE VII

COEFFICIENTS OF CORRELATION BETWEEN TOTAL LISTENING AND READING SCORES AND STANDARDIZED ACHIEVEMENT SCORES

	Total Listening	Total Reading	Paragraph Meaning	Word Meaning
Listening	—	.452**	.075	.211
Reading		—	.099	.260
Paragraph			—	.556**
Word				—

** Significant at the .01 level

TABLE VIII

COEFFICIENTS OF CORRELATION BETWEEN LISTENING AND READING SUBSCORES AND STANDARDIZED ACHIEVEMENT SCORES

	Listening nondeleted	Listening deleted	Reading nondeleted	Reading deleted	Paragraph Meaning	Word Meaning
Listening nondeleted	—	.222	.080	.309*	-.020	.078
Listening deleted		—	.412**	.362*	.138	.235
Reading nondeleted			—	.124	-.040	.073
Reading deleted				—	.198	.351*
Paragraph meaning					—	.556**
Word meaning						—

** Significant at the .01 level

* Significant at the .05 level

between the scores on the listening and reading tests devised for the study, and another significant correlation between the two reading achievement subscores. When the four listening and reading subscores were compared to the achievement subscores, as shown in Table VIII, a significant correlation did emerge between the word meaning score and the reading-deleted score. There was still no correlation between paragraph meaning and any of the research instrument subscores.

The Word Meaning Test required pupils to read a sentence and then select the correct word to complete the sentence. The research instrument was similar in that it was also based on sentence comprehension. The Paragraph Meaning Test deals with general comprehension of larger units. Both Stanford subtests involved silent reading rather than oral reading as was required on the research instrument.

The lack of further correlation between the research instrument scores and the general achievement scores might be partly due to the specificity of the research test. It tests very specific understandings of syntactic patterns within a sentence, while the Stanford test deals with more general forms of comprehension and it has already been indicated that results were influenced by specific test items.

There is also the possibility that insisting on oral reading for the study may have hampered the comprehension of the more proficient readers. According to Goodman (1970, p. 15), "proficient readers, in fact, learn to use the reading process much more rapidly than they use the listening process". Proficient readers have learned to decode the meaning directly from print, rather than recoding first to an aural input. Since this is faster and more efficient, having to revert to gaining meaning from oral reading may in fact, slow the readers enough to actually hamper their comprehension. If this were the case, their comprehension of the test items would not have been as accurate as their general achievement would predict.

SPONTANEOUS RESTRUCTURING MISCUES

As the subjects read the stories and sentences orally, there was some evidence of spontaneous changing of the material to its optional alternate form. This falls under the third sub-category of transformation miscues noted by Y. Goodman (1971).

Since forty-eight children each read six sentences, the total number of restructurings possible was 288. The number of changes made in reading the full story was 22 or 7.6 per cent. The number made in the isolated test sentences was 21 or 7.3 per cent. Since this type of miscue seems to increase with proficiency in reading (Goodman, 1971), the children were grouped according to general achievement level in analyzing these miscues. The results are shown in Table IX.

TABLE IX

RESTRUCTURING MISCUES BY ACHIEVEMENT LEVELS

	Full Story				Isolated Sentence		
	Insertion	Omission	Total		Insertion	Omission	Total
H	1	14	15	H	0	9	9
A	1	6	7	A	3	9	12
Total	2	20	22	Total	3	18	21

H = high achievers   A = average achievers

It is possible that the different trends for high and average achievers occurred as a result of a different approach to the test situation itself. The children knew that they were to read a passage first and that some of the sentences would be repeated afterwards. The high achievers appeared to read the full story rather quickly for the general meaning. It is in precisely this sort of situation that Y. Goodman feels this type of miscue occurs. Having read the story, they turned to the sentences and, knowing that this was the actual test material, tended to read them with more attention to the exact phrasing and wording. The average readers, on the other hand, tended to be slightly more apprehensive of the testing situation, and possibly less systematic in their approach. They tended to read very carefully, word by word, through the full story and then, on finding that the story did not seem to be too difficult, they may have relaxed slightly in reading the test sentences. They seemed to be feeling fairly confident of the general meaning and to be expecting the questions to test only the general meaning.

Cosens (1974) found evidence of spontaneous changes toward the intact form on difficult transformations. The results of this study tend not to substantiate her results since most of the restructurings omitted material, rather than inserting it, even on difficult transformations. This is shown in the following table.

TABLE X

NUMBER OF RESTRUCTURING MISCUES FOR EACH TRANSFORMATION

Transformation	No. of Insertions	No. of Omissions	Total
Verb Phrase		3	3
That + S		8	8
Noun Phrase + Other		7	7
Noun Phrase	2	15	17
Wh + Be	3	1	4
Wh		4	4

The restructurings do not favour the intact form as Cosens found, even on difficult items. The exception is the Wh + Be deletion, but again, the results conflict with Cosens findings, since she found that the Wh + Be deletion appeared to be easier in deleted form than in intact form.

The responses given to the questions were generally correct after restructuring, as shown in the following table.

TABLE XI

CORRECTNESS OF RESPONSES AFTER RESTRUCTURING

	Full Story		Isolated Sentences	
Response	Insertion	Omission	Insertion	Omission
Correct	2	16	2	15
Incorrect	0	4	1	3

It appears that there may be a relationship between this type of restructuring miscue and comprehension. However, on this small amount of evidence it is not possible to indicate the nature of that relationship. Whether the higher comprehension scores are the result of restructuring or whether restructuring occurs because the comprehension is better is only speculation at this point.

SUMMARY

The results of the two-way analysis of variance indicated no significant differences between the main effects of listening or reading and deleted or nondeleted material, but did indicate significant interaction effects. This interaction seemed to be closely related to the relative ease or difficulty of the items examined.

Regarding general achievement, there was a significant correlation between scores on the Word Meaning Test (Stanford Achievement Test) and reading scores on deleted items (research instrument). Although restructuring while reading orally did occur, the number of this type of miscue was very small. Most of the restructurings which did occur changed nondeleted structures into deleted structure form. These spontaneous changes seemed to be somewhat related to comprehension, but not related at all to the difficulty of the transformations.

CHAPTER V

SUMMARY, CONCLUSIONS AND IMPLICATIONS

SUMMARY

The purpose of the study was to investigate the nature of the relationship between a beginning reader's listening comprehension and oral reading comprehension of deleted or nondeleted material.

The design consisted of four 2x2 factorial designs, employing two treatments (listening and reading) and two forms of the stimulus material (deleted and nondeleted items). The data were analyzed through a two-way analysis of variance, taken four times and through Scheffe tests to compare cell means. In addition, there was an item analysis to examine the effect of each deletion produced structure. Coefficients of correlation were calculated between research instrument scores and general achievement. Oral reading restructurings in which the subjects read the test sentences spontaneously applying the alternate optional form were also noted.

A pilot study was carried out to determine the feasibility and practical considerations of the study and to assess test items. The necessary level of mastery on the Word Recognition Test was determined and was set at ninety per cent.

The sample was chosen from three middle-class Edmonton schools. Since the test passages were based on the Ginn Basic Readers, none of the subjects chosen were receiving instruction in this series. There were forty-eight students, none of whom were non-English speaking nor repeating a grade. Before being eligible for the sample, all the subjects passed the Word Recognition Test consisting of all of the words to appear in the passages. The forty-eight subjects randomly selected from the eligible group were then assigned to their four cells.

Two of Cosens' (1974) basic passages were revised for the reading and listening tasks, but a new test instrument had to be devised since the cloze procedure is unsuitable for measuring listening comprehension. Six deletion types were included in the Listening-Reading Comprehension Test, and these were the noun phrase deletion, verb phrase deletion, noun phrase plus other elements deletion, WH deletion, WH + Be deletion, and (that) + S as object deletion. The passages were written in two versions so that the effect of both the deleted and the nondeleted forms of the same sentence could be analyzed. Deleted and nondeleted items were balanced and alternated in the test passages.

Each subject listened to a passage and read a passage orally; both tasks were followed by a comprehension test to which they responded orally. The listening situation was presented on an audio-tape so that uniform presentation was ensured, and it resembled the listening tasks often found in primary classrooms where children listen to tapes and records. The oral reading situation was presented in booklet form in primary type-writing. The problem of word recognition was controlled for through the administration of the Word Recognition Test. The subject was exposed to the full passage, then to each test sentence followed by the test questions presented in such a way as to prevent rereading of the sentence. This was done to maintain the same format for both the reading and listening tasks and to control for memory.

The test questions and their administration were identical for both tasks.

FINDINGS AND DISCUSSION OF THE HYPOTHESES

Null Hypothesis One

Statement. There will be no significant difference between listening comprehension scores and reading comprehension scores.

On the basis of the findings shown in Table II, the hypothesis was not rejected.

Discussion. The overall scores showed no significant difference between listening and reading comprehension. On one of the four analyses, the one in which there was no interaction, there was a trend toward higher scores on listening comprehension but this trend was not significant at the .05 level.

When the difficulty of the items and the form of the material were considered, as shown in Table VI, there were significant differences. For easy transformations in nondeleted form, reading comprehension scores were significantly higher than listening scores. For difficult transformations in nondeleted form, listening comprehension scores were significantly higher. For easy transformations in deleted form, there was a trend for listening comprehension scores to be higher, and on one of the analyses, the trend was significant.

While there were significant differences between listening and reading comprehension scores when such factors as level of difficulty and form of the material were considered, these differences seemed to cancel one another out when the overall scores were considered. Because of this tendency, the hypothesis that there would be no significant difference between listening and reading scores was not rejected.

Null Hypothesis Two

Statement.

(a) There will be no significant difference on listening comprehension scores between deleted and nondeleted items.

(b) There will be no significant difference on reading comprehension scores between deleted and nondeleted items.

On the basis of the findings presented in Table VI, both parts (a) and (b) of this hypothesis are partially rejected.

Discussion. In examining the listening comprehension scores, three of the four analyses showed no significant difference between deleted and nondeleted items. However, on the fourth, there was a significant difference favoring the nondeleted form. This was on the difficult transformations. The reading comprehension scores showed significant differences on two of the four analyses. Once again it was the nondeleted form that was favored, but for the reading scores this was on easy transformations.

It appeared that for both listening and reading comprehension scores there were significant differences with higher scores on nondeleted items. However, for listening comprehension this difference occurred only on difficult transformations and for reading comprehension this difference occurred only on easy transformations. Since the differences between the scores were not significant in all the situations, this hypothesis is only partially rejected.

Null Hypothesis Three

Statement. There will be no significant correlation between listening and reading scores as measured by the Listening and Reading Comprehension Test, and general achievement as measured by the subtest scores on word meaning and paragraph meaning of the Stanford Achievement Test.

On the basis of the findings shown in Tables VII and VIII, the hypothesis was not rejected.

Discussion. As Table VII indicates, there was a significant correlation between the two reading achivement test subscores and also a significant correlation between the listening and reading scores, but scores on the Listening and Reading Comprehension Test did not correlate at the .05 level of significance with the achievement scores.

When subscores of the Listening and Reading Comprehension Test were considered, as shown in Table VIII, only the reading score on deleted items correlated at the .05 level with the Word Meaning Test scores. There appeared to be definite trends, with both nondeleted subscores correlating in the same way to the achievement subscores and both deleted subscores correlating in the same way to achievement subscores. However, because of the lack of further significant correlation, this hypothesis was not rejected.

CONCLUSIONS

On the basis of literature reviewed and from an analysis of the findings of this study, the following conclusions have been reached.

Conclusion One

In considering the way in which material is presented for children to process, one mode is not necessarily in itself better than another. Children do not find either listening or reading consistently more effective in attaining comprehension of specific sentences. There appears to be a slight trend toward higher listening comprehension scores but comprehension of sentences appears to depend on other factors in the material itself. Two of these factors may be the level of difficulty of the material and the format of the sentences when optional stylistic alternatives are possible.

Conclusion Two

Some deletion product sentence types are easier than others for comprehension. The overall rank from easiest to most difficult appears to be verb phrase deletion, (that) plus S deletion, noun phrase plus other elements deletion, noun phrase deletion, WH plus Be deletion, and WH deletion. The WH deletion consistently appears by far the most difficult.

Some interesting speculations may be made on the relative ease or difficulty of the sentences. At present information is not available on the possible discrepancies in frequency of the sentence types in written and oral forms of the language. It might be that some patterns are more appropriate to the written form than to the oral or vice versa, and this may contribute to differences in comprehension scores. For example, the intact form of the noun phrase deletion may be more appropriate (or more frequent) in the written mode, while the deleted form may be more appropriate in the oral mode. Frequency counts of these sentences in written and oral forms of English might help to shed some light on this matter.

A second area of speculation concerning these results is the possibility of meaning difference as signalled by omission or deletion of material. This would take the form of non-content semantic information, perhaps in the nature of contrastive stress. The possibility that this sort of meaning difference exists between the two forms might partially account for relative ease or difficulty of the deletion types.

Conclusion Three

The deletion or nondeletion of redundant content in a sentence does not account completely for difficulty in comprehension of the sentence as shown by the comprehension scores. In this study, deletion produced sentences were sometimes more difficult and at other times nondeleted sentences were more difficult. Cosens (1974) found, in fact, the WH plus Be deletion to be significantly easier in intact form.

Analysis indicated that on easy transformations, there was a tendency for reading scores to be higher for nondeleted material and for listening scores to be higher on deleted material. On difficult transformations, reading scores were higher on deleted material, while listening scores were the same or lower on deleted material.

The interrelationships among the level of difficulty, the form of the material and the manner of presentation appear to be very complex.

Conclusion Four

When considering the individual himself, there are also many factors which appear necessary to consider. General reading achievement seems to have little relationship to an understanding of these specific syntactic patterns. General reading achievement is not a good predictor of a child's achievement on either listening or reading comprehension of deletion produced structures. It is more likely that the child's own oral language production or the speech patterns in his own linguistic environment would be better predictors of high scores on an instrument like the Listening and Reading Comprehension Test. However, it is necessary to remember that the acquisition of language (as evidenced by aural or listening comprehension scores) follows a different trend from the acquisition of literacy (as evidenced by reading comprehension scores).

Summary

In conclusion, there appear to be four closely interrelated factors which influence a child's comprehension of material presented to him. The first is the child himself, his experience (including his linguistic experience), maturity and ability. The second is the level of difficulty of the material presented to him. The third is the presence of optional stylistic differences which occur in the material. The fourth is the mode of presentation of the material.

IMPLICATIONS FOR THE CLASSROOM TEACHER

The first important consideration for the classroom teacher is that listening comprehension is not necessarily easier or more difficult than reading comprehension for all children in all situations. There may be wide discrepancies in performance even within one child when the task changes from one form of comprehension to the other. When a child finds comprehension difficult in one mode, it may happen that changing to another mode will help him and that general comprehension skills may be taught in one mode and then the student can be helped to apply these skills and understandings in the other, more difficult mode. The difficulty is that one cannot assume that listening comprehension performance and reading comprehension performance will automatically be the same for a given child. Deliberate and careful teaching remains necessary in whichever mode a child finds difficult in a given situation.

In order to teach comprehension effectively, it is necessary to be aware of the factors which might cause difficulty for a child in comprehending material read or listened to. Stylistic differences may cause difficulties due to discrepancies between the author's language and writing style and the student's ideolect. Occasionally the surface structure clues may miscue a student. For example, one of the reasons why the WH plus Be deletion tends to be so much more difficult in reading comprehension than in listening is that when children see the "who was" pattern as, "Sam, who was his pet dog, . . .", they tend to cue in on the "who" and read it as the more familiar question form.

Another important consideration is the lack of correlation between general achievement and performance on this kind of comprehension task. Teachers should not expect that the high achievers in the class will generally understand each structure or that the low achievers in the class will not understand the specific structures. The child's general experience or linguistic background may be a more important factor in this kind of comprehension than general ability or the ability to do well on standardized achievement tests. The ability to perform on standardized achievement tests may be more closely related to an ability to relate specific sentence meanings to the unified whole of a paragraph or story.

In teaching comprehension skills, the technique of isolating sentences from the story and asking specific questions about that sentence may be a useful one as a preparatory step to having beginning readers read or listen to a whole passage to find an answer to a specific question. It is not uncommon for young readers to be unable to answer a question even after having located the very sentence containing the appropriate information. In the hierarchy of comprehension skills, sentence comprehension may be an intermediate step above the understanding of the meanings of words and phrases, but below understanding of the main ideas and skills such as skimming and scanning.

Oral reading is an important part of beginning reading instruction. In examining oral reading errors or miscues, the appearance of spontaneous changes in the surface structure of a sentence which do not change the underlying meaning of the text sentence is a sign of growing proficiency and familiarity with the reading task and should not be discouraged.

In order to teach comprehension well, it may be necessary to pinpoint the source(s) of difficulty in the child, in the material, and in the manner and mode of presentation.

SUGGESTIONS FOR FURTHER RESEARCH

While overall performance in listening and reading comprehension did not differ significantly for the children in this sample, the pattern of comprehension scores was very different when the intrinsic level of difficulty of the sentence types and presence or absence of deletable material were considered. Only grade two students were included in the sample. Further research at other grade levels could be carried on to investigate the constancy of the comprehension patterns found in this study. It would be particularly useful to study the performance of grade one children, since many of the beginning reading programs are now based on the language-experience type of approach which stresses development of listening skills.

Future research should also investigate the interrelationships and patterns between silent reading comprehension, oral reading comprehension, and listening comprehension, to find out whether and at what points one type of comprehension becomes most effective for elementary school children. For example, one could repeat this study with one rather than two stories, and with three treatment groups (listening, oral reading, and silent reading). This would be closer to a traditional research design and the analysis of data gained would be much simpler to read and interesting to compare with the data from this study. Experimental studies investigating children's ability to transfer from one comprehension situation to another are also necessary, as are studies investigating and comparing methods of teaching for this type of transfer.

Since the level of difficulty of the sentence appeared to be such an important factor in effective comprehension, it is important to find out just what it is that makes a given sentence more difficult than another. The syntactic pattern appears to be only part of the answer. The effects of other transformations might be investigated, but research is also needed in the question of the effects of surface structure clues, compression of information, semantic considerations and concept levels involved in given sentences. It is much easier to teach a skill when that which causes the difficulty for the learner is a known factor.

The reasons why children varied so systematically in their ability to deal with deleted and nondeleted material should also be investigated. Further research is necessary to determine what, if any, differences in semantic information are signalled by deleted and nondeleted forms. Frequency counts might indicate whether one form is more appropriate than the other in written and in oral language. The question of how information-packing or compressing in the surface structure might make comprehension more difficult also bears further investigation.

Further research into the relationship between acquisition and production of speech patterns to reading and listening comprehension is necessary. Studies have already shown (Ruddell, 1963; Tatham, 1968 a and b) that children's comprehension is better when the material they are asked to read reflects their own oral language patterns. However, little research has been done in relating the structures common in their linguistic environment to reading comprehension. The language patterns that children hear around them as they grow up are often different from the patterns they produce, and it may be that the language structures used by the people in their environment are closely related to the child's reading comprehension.

A final suggestion for further research concerns the cloze technique of measuring comprehension. In measuring children's reading comprehension of structural variations in sentences from the same content in the passages, the results gained from this study and that of Cosens (1974) are somewhat contradictory. Cosens used a cloze test, while this study relied on a WH-question and an oral response. The rank orders of difficulty of the sentence types appeared to be different. Cosens found that comprehension scores were higher on the intact forms of the transformations that children found difficult. This study indicated that reading comprehension scores were lower on the intact or nondeleted forms of difficult sentence types, although the differences were not significant. It appears possible that the two testing techniques measure different things in comprehension and further research should be carried out on these techniques.

CONCLUDING STATEMENT

This study has given an indication of the complexity of the question of comprehension. It appears that there is a tremendous interplay between the language used (by the author and by the reader), the level of difficulty of the material, the mode in which the sentence is presented and probably other factors within the individual himself. Listening comprehension is not necessarily more effective for grade two students than reading comprehension. Nondeleted material, with its redundant content information, is not necessarily easier for the child to understand than the deleted form. It appears that other factors help to determine ease or difficulty of material. Good teaching of comprehension skills must take into account all of these factors.

BIBLIOGRAPHY

Ahlvers, E. R. *A study of the effects of teaching intonation skills on reading comprehension in grade one.* (Doctoral dissertation, Pennsylvania State University) Ann Arbor, Mich.: University Microfilms, 1970, No. 71-16, 562.

Anderson, H. A. Needed research in listening. In S. Duker (Ed.), *Listening: Readings*. New York: Scarecrow Press, Inc., 1966.

Barnard, D. P. *A study of the effect of differentiated auditory presentation on listening comprehension and rate of reading comprehension at the sixth grade level.* (Doctoral dissertation, Boston University School of Education) Ann Arbor, Mich.: University Microfilms, 1969, No. 70-22, 501.

Biemiller, A. The development of the use of graphic and contextual information as children learn to read. *Reading Research Quarterly*, 1970, *6*, (1), 75-96.

Brown, R. *A first language*. Cambridge, Mass.: Harvard University Press, 1973.

Burke, C. L. *A psycholinguistic description of grammatical restructurings in the oral reading of a selected group of middle school children*. (Doctoral dissertation, Wayne State University) Ann Arbor, Mich.: University Microfilms, 1969, No. 70-3416.

Burrow, W. H. *Listening and reading comprehension in special class educable mentally handicapped children at selected developmental levels*. (Doctoral dissertation, University of Connecticut) Ann Arbor, Mich.: University Microfilms, 1969, No. 71-15, 964.

Carroll, J. B. Defining language comprehension: some speculations. Paper presented at the research workshop on language comprehension and the acquisition of knowledge, Durham, North Carolina, April, 1971a. Eric ED 057 698.

Carroll, J. B. Development of native language skills beyond the early years. In C. E. Reed (Ed.), *The learning of language*. National Council of Teachers of English. New York: Appleton-Century-Crofts, Educational Division, Meredith Corporation, 1971b.

Chall, J. S. *Learning to read: the great debate*. New York: McGraw-Hill, 1967.

Chomsky, N. *Aspects of the theory of syntax*. Cambridge, Mass.: The M.I.T. Press, 1965.

Cosens, G. V. The effect of deletion produced structures on word identification and comprehension of beginning readers. Unpublished doctoral dissertation, University of Alberta, 1974.

Dale, P. S. *Language development structure and function*. Hinsdale, Ill.: The Dryden Press, Inc., 1972.

Day, W. F. & Beach, B. R. A summary of findings (excerpt from Air Force technical report no. 5921). In S. Duker (Ed.), *Listening: Readings*. New York: Scarecrow Press, 1966.

Derwing, B. L. *Transformational grammar and language acquisition: a study in the empirical and methodological foundations of contemporary linguistic theory*. (Doctoral dissertation, Indiana University) Ann Arbor, Mich.: University Microfilms, 1970, No. 70-26, 913.

Eagan, R. L. An investigation into the relationship of the pausing phenomena in oral reading and reading comprehension. Unpublished doctoral dissertation, University of Alberta, 1973.

Fagan, W. T. An investigation into the relationship between reading difficulty and the number and types of sentence transformations. Unpublished doctoral dissertation, University of Alberta, 1969.

Feinham, L. J. *An investigation of psycholinguistic factors contributing to comprehension difficulty in initial reading*. (Doctoral dissertation, Stanford University) Ann Arbor, Mich.: University Microfilms, 1969, No. 70-10, 451.

Fleming, D. Developmental stages in the reading process of beginning readers. Unpublished master's thesis, University of Alberta, 1974.

Goodman, K. S. A linguistic study of cues and miscues in reading. *Elementary English*, 1965, *42*, 639-643.

Goodman, K. S. The psycholinguistic nature of the reading process. In K. S. Goodman (Ed.), *The psycholinguistic nature of the reading process*. Detroit: Wayne State University Press, 1968.

Goodman, K. S. Reading process. In K. S. Goodman & O. S. Niles, *Reading process and program*. Urbana, Ill.: National Council of Teachers of English, 1970.

Goodman, Y. M. Longitudinal study of children's oral reading behavior. U.S.O.E. Final report project no. 9-E-062, U.S. Department of Health, Education and Welfare, Sept. 1971. Eric ED 058 008.

Gough, P. B. Experimental psycholinguistics. In W. O. Dingwall (Ed.), *A survey of linguistic science*. College Park, Ma.: Linguistics Program, University of Maryland, 1971.

Hampleman, R. S. Comparison of listening and reading comprehension ability of fourth and sixth grade pupils. (Doctoral dissertation, Indiana University) Ann Arbor, Mich.: University Microfilms, 1955, No. 13,220.

Harwood, K. A. A concept of listenability. In S. Duker (Ed.), Listening: Readings. New York; Scarecrow Press, Inc., 1966.

Hudson, R. A. On clauses conyaining conjoined and plural noun-phrases in English. Lingua, 1970, 24, (3), 205-253.

Jenkinson, M. J. Selected processes and difficulties of reading comprehension. (Doctoral dissertation, University of Chicago) Ann Arbor, Mich.: University Microfilms, 1957, No. 58-6689.

Jenkinson, M. J. Excerpt from the A.T.A. manual. 1960. (mimeographed).

Jones, J. Listening accompaniment to silent reading of plays in grade four: imagery and comprehension. (Doctoral dissertation, Boston University) Ann Arbor, Mich.: University Microfilms, 1970, No. 70-22, 515.

Lefevre, C. A. Linguistics and the teaching of reading. New York: McGraw-Hill, 1964.

Lefevre, C. A. A multidisciplinary approach to language and to reading: some projections. In K. S. Goodman (Ed.), The psycholinguistic nature of the reading process. Detroit: Wayne State University Press, 1968.

Loban, W. The language of elementary school children. N.C.T.E. research report no. 11. Champaign, Ill.: National Council of Teachers of English, 1963.

Means, C. E. A study of the relationship between the use of intonation patterns in oral reading and comprehension in reading. (Doctoral dissertation, Pennsylvania State University) Ann Arbor, Mich.: University Microfilms, 1969, No. 70-7233.

Menyuk, P. A descriptive study of the syntactic structures in the language of children: nursery school and first grade. (Doctoral dissertation, Boston University) Ann Arbor, Mich.: University Microfilms, 1961, No. 61-3361.

Menyuk, P. Sentences children use. Research monograph no. 52. Cambridge, Mass.: The M.I.T. Press, 1969.

Menyuk, P. The acquisition and development of language. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1971.

Morris, G. A. A comparison of fourth graders' oral and silent reading behavior in basal readers, science, and social studies materials. (Doctoral dissertation, University of Pittsburgh) Ann Arbor, Mich.: University Microfilms, 1970, No. 71-16, 187.

Okada, M. *The comprehension of textual information presented through single and multiple sense modalities.* (Doctoral dissertation, University of Colorado) Ann Arbor, Mich.: University Microfilms, 1969, No. 70-5879.

Quaintance, W. Developing comprehension through word recognition skills. Paper presented at the International Reading Association, Atlantic City, N. J., April, 1971. Eric ED 055 730.

Rommetveit, R. *Words, meanings, and messages.* New York: Academic Press, 1968.

Ruddell, R. B. The effect of the similarity of oral and written patterns of language structure on reading comprehension. Unpublished doctoral dissertation, Indiana University, 1963.

Ryan, E. B. & Semmel, M. I. Reading as a constructive language process. *Reading Research Quarterly*, 1969, *5*, (1), 59-83.

Slobin, D. I. Developmental psycholinguistics. In W. O. Dingwall (Ed.), *A survey of psycholinguistic science.* College Park, Ma.: Linguistics Program, University of Maryland, 1971.

Smith, C. S. An experimental approach to children's linguistic competence. In J. R. Hates (Ed.), *Cognition and the development of language.* New York: John Wiley & Sons, Inc., 1970.

Smith, F. *Understanding reading.* New York: Holt, Rinehart and Winston, 1971.

Smith, F. *Psycholinguistics and reading.* New York: Holt, Rinehart and Winston, 1973.

Smith, E. B., Goodman, K. S. & Meredith, R. *Language and thinking in the elementary school.* New York: Holt, Rinehart and Winston, 1970.

Spearritt, D. *Listening comprehension - a factorial analysis.* Australian council for educational research, 1962.

Stauffer, R. G. *Teaching reading as a thinking process.* New York: Harper & Row, 1969.

Strickland, R. G. *The language of elementary school children: its relationship to the language of textbooks and the quality of reading of selected children.* Indiana University: Bureau of Educational Studies and Testing, 1962.

Tatham, S. M. *Reading comprehension of materials written with select oral language patterns: a study at grades two and four.* (Doctoral dissertation, University of Wisconsin) Ann Arbor, Mich.: University Microfilms, 1968a, No. 69-1008.

Tatham, S. M. Using multiple choice questions to measure the effect on comprehension of materials written with select oral language patterns. Paper presented at the American Educational Research Association conference, Chicago, Feb., 1968 b. Eric ED 018 355.

Treadway, Jr., G. H. Effects of redundancy on reading comprehension of second and fifth grade children. (Doctoral dissertation, University of Arizona) Ann Arbor, Mich.: University Microfilms, 1970, No. 71-8436.

Venezky, R. L. Language and cognition in reading. (Technical report no. 188) University of Wisconsin: Wisconsin Research and Development Center for Cognitive Learning, 1972. Eric ED 067 646.

Wagner, R. E. Reading skills or language skills? In J. A. Figurel (Ed.), Improvement of reading through classroom practice. International Reading Association Conference Proceedings, vol. 9. Newark, N. J.: International Reading Association, 1964.

APPENDIX A

TRANSFORMATIONS RANKED FROM LEAST TO MOST DIFFICULT IN TERMS OF MEAN PROPORTION OF EXACT REPLACEMENTS ON COSENS' CLOZE TESTS

Grade One	Grade Two
*(That) + S object	Preposition deletion
*Verb phrase deletion	*(That) + S object
Comparative deletion	*Verb phrase deletion
Be deletion	*WH deletion
*WH deletion	Imperative deletion
Preposition deletion	*Noun phrase deletion
*Noun phrase deletion	#*Noun phrase + aux. (verb)
#*Noun phrase + verb + other	*WH + Be deletion
*WH + Be deletion	Performative deletion
Imperative deletion	#*Noun phrase + verb + other
Performative deletion	Be deletion
#*Noun phrase + aux. (verb)	Comparative deletion

*Transformations selected for this study

#Conflated as one transformation for purposes of this study

(Cosens, 1974, p. 140)

APPENDIX B

EXAMPLES AND FREQUENCY OF TRANSFORMATIONS IN COSENS' STUDY

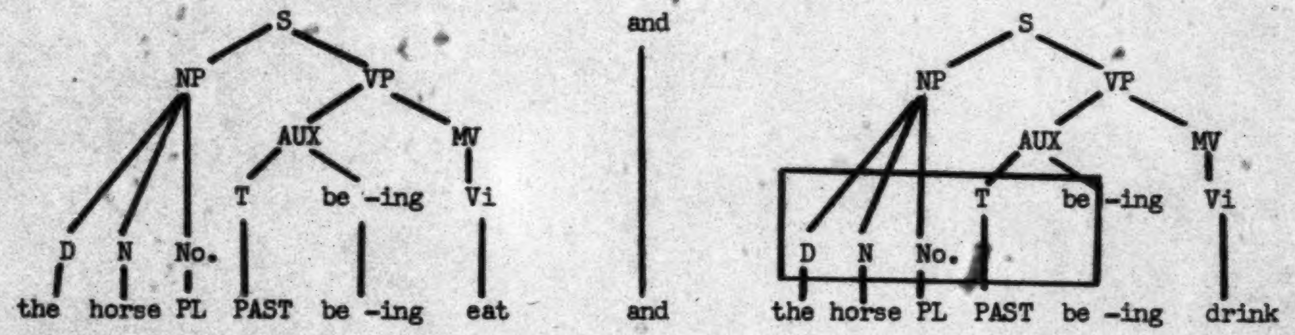
Transformation	Example	Per Cent of Frequency in Ginn						
		PP	P	1	2^1	2^2	3^1	3^2
WH deletion	Here are the very best shoes you can buy.	0.8	0.0	1.6	3.2	3.5	4.6	2.2
Be deletion	Nothing but bread in the wagon.	1.9	3.4	5.3	7.0	4.7	3.2	7.8
WH + Be deletion	Here is a big bear funny and brown.	4.8	16.4	10.0	12.4	13.7	15.2	12.9
(That) + S object	They think I am too little.	0.0	0.8	3.0	4.3	6.7	7.4	7.5
Performative deletion	Zoom! Zoom!	4.3	2.7	3.7	2.7	2.3	2.1	1.9
Imperative deletion	Look in this bag.	80.7	40.5	43.0	27.4	16.1	9.2	6.2
Preposition deletion	I can help you make a cake.	0.0	1.5	0.8	2.2	0.9	3.5	1.3
Verb phrase deletion	Flip and Pony went fast.	1.6	8.0	7.5	4.8	10.2	8.5	11.8
Noun phrase deletion	Mr. Green saw the girls and came to the door.	0.0	8.4	8.1	14.0	11.7	19.8	14.0
Noun phrase + aux. (verb)	The fly sat on his nose and then on his ear.	4.0	11.1	7.1	11.8	18.7	10.3	16.1
Noun phrase + verb + other elements	A black bear came to the pond to drink and to catch fish.	1.5	5.0	4.3	8.1	7.9	12.0	14.5
Comparative deletion	Before long he could read as well an anyone in the woods.	0.0	2.3	5.7	2.2	3.5	4.2	3.8

(Cosens, 1974, pp. 95-97 and p. 113)

APPENDIX C

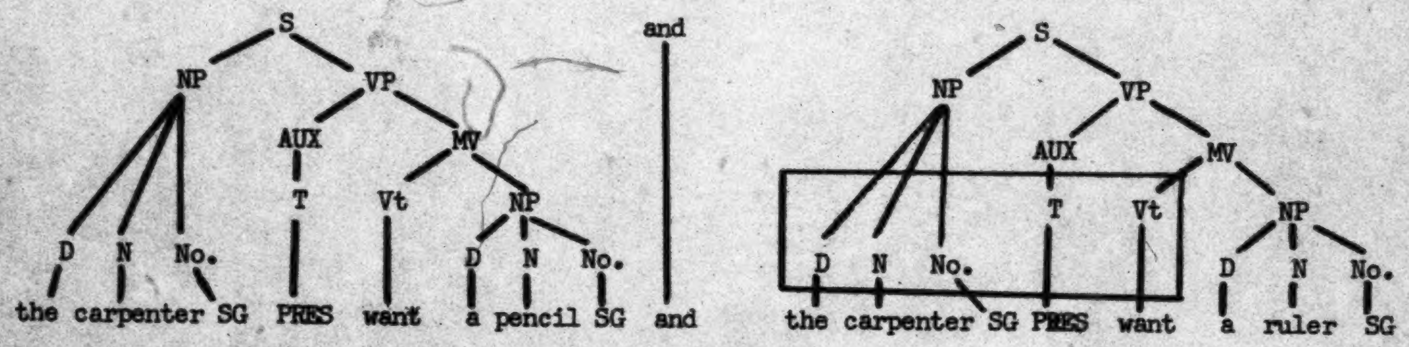
DERIVATION OF NOUN PHRASE + AUX (VERB) TRANSFORMATION (A)

The horses were eating and drinking.


S
NP
VP
AUX
MV
D
N
No.
T
be -ing
Vi
the horse PL PAST be -ing eat
and
and
S
NP
VP
AUX
MV
D
N
No.
T
be -ing
Vi
the horse PL PAST be -ing drink

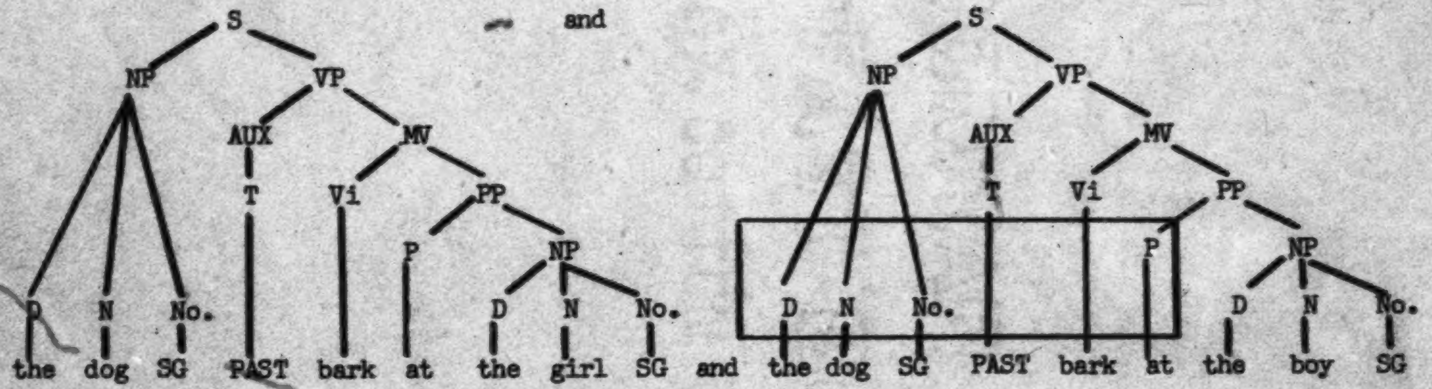
DERIVATION OF NOUN PHRASE + AUX (VERB) TRANSFORMATION (B)

The carpenter wants a pencil and a ruler.


S
NP
VP
AUX
MV
D
N
No.
T
Vt
NP
D
N
No.
the carpenter SG PRES want a pencil SG
and
and
S
NP
VP
AUX
MV
D
N
No.
T
Vt
NP
D
N
No.
the carpenter SG PRES want a ruler SG

DERIVATION OF NOUN PHRASE + VERB + OTHER ELEMENTS TRANSFORMATION

The dog barked at the girl and the boy.


S
and
S
NP
VP
NP
VP
AUX
MV
AUX
MV
T
Vi
PP
T
Vi
PP
P
NP
P
NP
D
N
No.
D
N
No.
D
N
No.
D
N
No.
the dog SG PAST bark at the girl SG and the dog SG PAST bark at the boy SG

APPENDIX D

THE WORD RECOGNITION TEST

it
to
is
the
as
she
at
of
had
sat
pop
him
they
this
one
can
red
game
old
by
that
up
into
and
his
I'm
soon
two

white
shoes
which
talking
going
Fred
tent
started
loud
Mother
found
children
green
glad
come
air
brought
funny
Father
circus
ready
away
clowns
were
was
you
Ben

could
glove
hats
all
who
fat
named
car
dot
trick
boy
little
tall
will
good
park
Mary
then
laughing
policeman
dressing
everybody
morning
called
me
on
in

Jim
began
watched
top
take
too
Tom
got
out
guess
around
days
wanted
catch
high
once
small
face
helped
painted
there
where
tinkle
down
said
Sam
are

best
looking
like
think
what
name
put
suit
bell
hair
thump
get
box
with
their
baseball
places
Kelly
people
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THE LISTENING-READING COMPREHENSION TEST

DIRECTIONS FOR THE LISTENING-READING COMPREHENSION TEST

First I would like you to read (listen to) a story. At the end of the story, you will see (hear) some sentences from the story again and there will be a question about each sentence for you to answer. Do you understand what I want you to do? (Pause for clarification if necessary.)

This is the story.

That's the end of the story. Now here is the first sentence. . . .

And the question is. . . .

And that's the end.

STORY A VERSION 1

Three clowns were dressing in a small tent. They were looking for funny hats and big shoes. The three clowns wanted to look as funny as they could for the big circus.

There was a tall clown named Tom. Tom put on a policeman suit and he put on green hair. He got into his old car. Away he went into the big tent.

Fred was the fat clown. He had a red suit. Fred saw two hats in the box. The hat Fred put on had a bell on the top. Tinkle! Tinkle! went the bell. "I think that the children will like the hat," said Fred. The fat clown went out with Sam, his trick goat.

The little clown was dressing, too. His name was Jim. Jim painted his face white and he put a big red dot on his nose. Into the circus tent he went!

Mary and Ben were in the circus tent.

"Look!" called Mary. "Here come the clowns!"

"I like funny clowns the best of all," said Ben.

STORY A VERSION 2

Three clowns were dressing in a small tent. They were looking for funny hats and big shoes. The three clowns wanted to look as funny as they could for the big circus.

There was a tall clown named Tom. Tom put on a policeman suit and green hair. He got into his old car. Away he went into the big tent.

Fred was the fat clown. He had a red suit. Fred saw two hats in the box. The hat that Fred put on had a bell on the top. Tinkle! Tinkle! went the bell. "I think the children will like the hat," said Fred. The fat clown went out with Sam who was his trick goat.

The little clown was dressing, too. His name was Jim. Jim painted his face white and put a big red dot on his nose. Into the circus tent he went!

Mary was in the circus tent and Ben was in the circus tent.

"Look!" called Mary. "Here come the clowns!"

"I like the funny clowns the best of all," said Ben.

STORY A TEST SENTENCES AND QUESTIONS

1. Tom put on a policeman suit and (he put on) green hair.
   Who had on green hair?

2. The hat (that) Fred put on had a bell on the top.
   Which hat had a bell on the top?

3. "I think (that) the children will like the hat," said Fred.
   What does Fred think?

4. The fat clown went out with Sam (who was) his trick goat.
   What is Sam?

5. Jim painted his face white and (he) put a big red dot on his nose.
   Who put a big red dot on his nose?

6. Mary (was in the circus tent) and Ben (were) was in the big circus tent.
   Where is Mary?

STORY B VERSION 1

"Mother!" Ben called. "Guess where I'm going. Father is going to take me to the ball game."

Mother said to Ben, "I'm glad that you can go to the game."

The days went by. Then one morning Ben said, "This is the day I'm going to the ball game."

Mother helped Ben get ready. She brought him his hat. Ben got out his baseball glove.

Ben went to Kelly Park for the game and Father went to Kelly Park for the game. Soon Ben and Father found their places and sat down. All the people were talking and they were laughing.

Then the game started. All at once there was the loud pop of a ball! Everybody watched the ball go high up in the air. Then the ball began to come down. Thump it went into Ben's baseball glove.

The people around Ben called, "Good catch, boy!"

STORY B VERSION 2

"Mother!" Ben called. "Guess where I'm going. Father is going to take me to the ball game."

Mother said to Ben, "I'm glad you can go to the game."

The days went by. Then one morning Ben said, "This is the day that I'm going to the ball game."

Mother helped Ben get ready. She brought him his hat. Ben got out his baseball glove.

Ben and Father went to Kelly Park for the game. Soon Ben and Father found their places and they sat down. All the people were talking and laughing.

Then the game started. All at once there was the loud pop of a ball! Everybody watched the ball go high up in the air. Then the ball began to come down. Thump it went into Ben's baseball glove.

The people who were around Ben called, "Good catch, Boy!"

STORY B TEST SENTENCES AND QUESTIONS

1. Mother said to Ben, "I'm glad (that) you can go to the game."
   What does Mother feel glad about?

2. Then one morning Ben said, "This is the day (that) I'm going to the ball game."
   Which day is it?

3. Ben (went to Kelly Park for the game) and Father went to Kelly Park for the game.
   Where did Ben go?

4. Soon Ben and Father found their places and (they) sat down.
   Who sat down?

5. All the people were talking and (they were) laughing.
   Who was laughing?

6. The people (who were) around Ben called, "Good catch, boy!"
   Which people called, "Good Catch!"?

APPENDIX E

ORGANIZATION OF SUBJECTS FOR ANALYSIS (BY I.D. NUMBER)

Block X	Block Y	Block Z	Block Q
48	47	44	40
33	46	45	36
32	43	42	23
24	39	41	22
20	38	35	17
19	37	34	15
18	30	27	14
11	31	26	4
12	29	21	5
1	28	13	6
2	25	9	7
3	16	10	8

TRANSFORMATIONS REPRESENTED BY EACH QUESTION

Analysis One	Analysis Two
Question 1 - Noun phrase + other Question 3 - (That) + S object Question 5 - Noun phrase deletion	Question 2 - WH deletion Question 4 - WH + Be deletion Question 6 - Verb phrase deletion
Analysis Three	**Analysis Four**
Question 1 - (That) + S object Question 3 - Verb phrase deletion Question 5 - Noun phrase + other	Question 2 - WH deletion Question 4 - Noun phrase deletion Question 6 - WH + Be deletion